

# CAP 232



**Wingspan:** 1620mm (63.8 inch)



**Length:** 1430mm (56.3 inch)



**Weight:** 3500g - 4000g



**Engine:** 61 - 75 two stroke



**Radio:** 4 channel / 5 high torque servo  
and 1 standard servo

**KIT CONTENTS:** We have organized the parts as they come out of the box for better identification during assembly. We recommend that you regroup the parts in the same manner. This will ensure you have all of parts required before you begin assembly.

## KIT CONTENTS

### MAIN GEAR ASSEMBLY

- (2) Main gear aluminum
- (2) 65mm diameter wheel
- (2) Fiberglass wheel pant
- (4) 4mm x 20mm socket head screw
- (4) 8mm flat washer
- (4) 16mm flat washer
- (4) 4,5mm nut
- (4) Collar
- (4) 3mm x 4mm set screw
- (2) 4mm x 58mm axle
- (4) 4mm lock washer

### TAIL WHEEL ASSEMBLY

- (1) Tail wheel bracket w/wire
- (1) 25mm diameter wheel
- (2) 2mm collar
- (2) Nylon control clasp
- (2) 2mm x 16mm wood screw

### ELEVATOR CONTROL SYSTEM

- (1) 3mm x 150mm metal pushrod
- (1) 3mm x 85mm metal pushrod
- (2) M3 clevis
- (2) 3mm x 40mm screw
- (2) Set aluminum control horn
- (2) Nylon horn
- (2) Nylon ball link
- (2) Aluminum ball
- (2) 3mm x 12mm screw
- (2) 6mm flat washer
- (2) 3mm nut

### RUDDER CONTROL SYSTEM

- (1) 3mm x 165mm metal pushrod
- (1) M3 Clevis
- (1) 3mm x 40mm screw
- (1) Set aluminum control horn
- (1) Nylon horn
- (1) Nylon ball link
- (1) Aluminum ball
- (1) 3mm x 12mm screw
- (1) 6mm flat washer
- (1) 3mm nut

### AILERON CONTROL SYSTEM

- (2) 3mm x 70mm metal pushrod
- (2) M3 Clevis
- (2) 3mm x 45mm screw
- (2) Set aluminum control horn
- (2) Nylon horn
- (2) Nylon ball link
- (2) Aluminum ball
- (2) 3mm x 12mm screw
- (2) 6mm flat washer
- (2) 3mm nut

### MOTOR MOUNT ASSEMBLY

- (4) 4mm x 25mm screw
- (4) 4mm lock washer
- (4) 8mm flat washer
- (4) 4mm x 30mm screw
- (8) 4mm nut
- (4) 4mm lock washer
- (2) Engine mount

### THROTTLE CONTROL SYSTEM

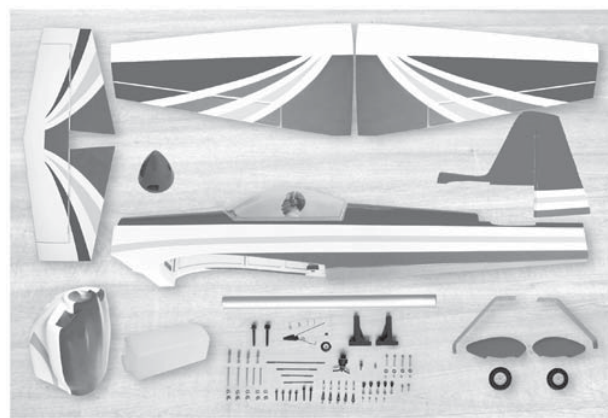
- (1) 1,3mm x 500mm wire
- (1) 3,5mm x 350mm nylon pushrod housing
- (1) Metal connector
- (1) 4mm x 4mm machine screw

### FUEL TANK

- (1) Nylon fuel tank
- (1) Metal clunk
- (1) Pre - assembled stopper w / 3 tube

### MISCELLANEOUS ITEMS

- (1) 19mm x 270mm diameter aluminum dihedral
- (2) 6mm x 45mm nylon screw
- (2) Nylon washer
- (1) Spinner
- (4) 2.6mm x 10mm wood screw
- (1) 25mm x 400mm orange tape
- (1) 25mm x 400mm blue tape



**TOOLS AND SUPPLIES NEEDED.**

- Medium C/A glue.
- 30 minute epoxy.
- 6 minute epoxy.
- Hand or electric drill.
- Assorted drill bits.
- Modeling knife.
- Straight edge ruler.
- 2 bender plier.
- Wire cutters.
- Masking tape.
- Thread lock.
- Paper towels.
- Rubbing alcohol.

**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.

**NOTE:**

1. 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. The Cap 232/ 61 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.
2. 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.
3. **The Cap 232/ 61 will perform 3-D aerobatics easily if you use the largest engines recommended within the engine range. If you setup your airplane to do 3D maneuvers, you will need to be throttle conscious; that is, never apply full throttle on straight and level flying or in dives to prevent flutter.**

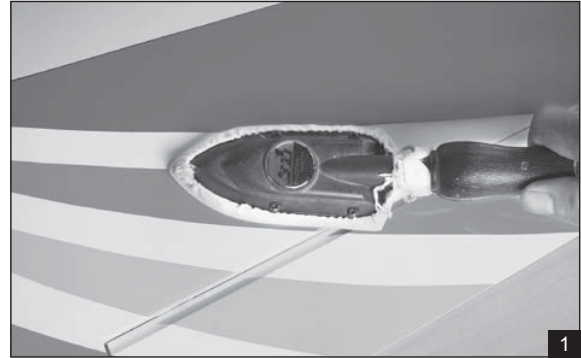
**SAFETY PRECAUTION:**

- This is not a toy.
- 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.

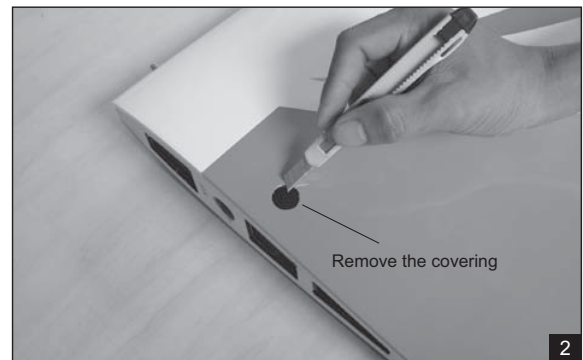
- Do not start the engine if people are near. Do not stand in line with the side of the propeller.
- Make engine adjustments from behind the propeller only. Do not reach around the spinning propeller.

**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.

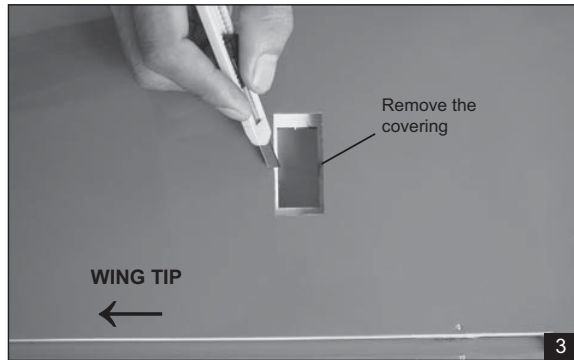
**INSTALL THE AILERONS SERVOS & PUSHRODS**

1. Install the rubber grommets and brass eyelets onto the aileron servo.
2. Turn the wing panel right side up. Using a modeling knife, remove the covering from over the precut servo lead exit hole in the root rib and the top of the wing sheeting. This hole will allow the servo leads to pass through when the wing halves are joined.



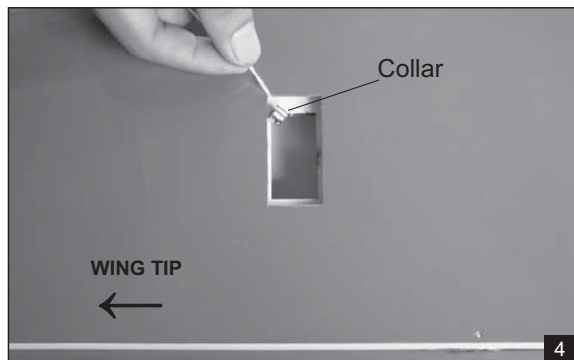
3. Install the servo in the wing require the use of one 305mm servo extension for each aileron servo. One Y-harness connector is required and is used to allow the aileron servo to plug into one slot in your receiver. You may have a computer radio that allows you to plug the servos into separate slots and then mix them together through the radio transmitter. If you choose to mix them with the radio rather than the Y-harness, refer to the instructions with your particular brand of radio.

- Attach the servo extension to the aileron servo. Secure the connectors together using a large piece of heat shrink tubing, tape or other method for securing the connectors together.
- Turn the wing panel right side up. Using a modeling knife, remove the covering from over the precut servo box.

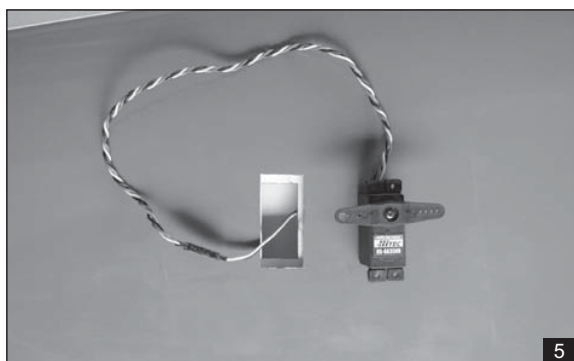


- Using the string as a guide and pass the string from the servo opening to the hole in the root of the wing.

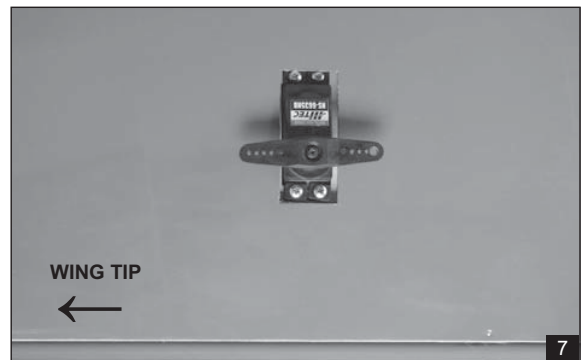
**!** *Note: A weigh tied to a string can be used first, then tied to the servo lead to pull it through.*



- Tie the string from inside the wing to the end of the servo wire. Pull the servo wire through the wing with the string. Tape the servo wire to the wing to prevent it from falling back into the wing.



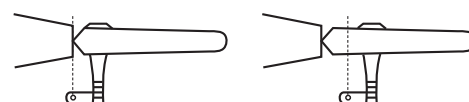
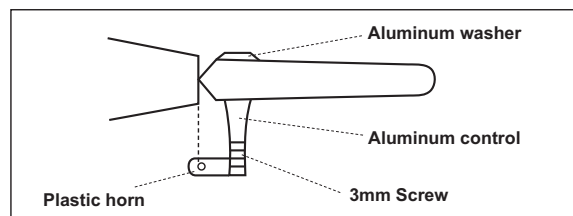
- Temporarily position the aileron servo into the servo bay. Drill a 1.6mm hole through the four mounting holes of the servo, drilling through the plywood mounting plate in the wing. Install and remove a servo mounting screw into each of the four holes. Insert a drop of thin CA into the holes to harden the wood. After the glue has cured, install the servo into the servo bay using the hardware that came with your servo. Center the servo and install a servo arm as shown.



- Repeat step # 1 - # 8 to install the second aileron servo in the opposite wing half.

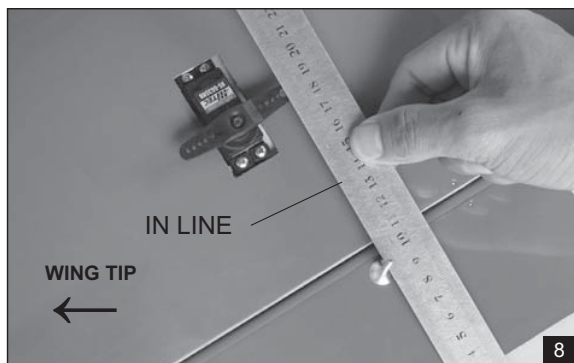
### INSTALLING THE CONTROL HORNS

- The aileron has a block wood plate for mounting the control horn. 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.



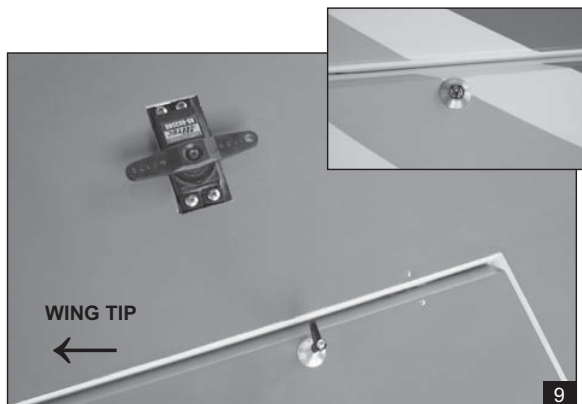
RIGHT

WRONG



2. Drill through the mark you made with a (3mm) drill bit. Hard the hole with thin CA. Install the control horn. Remember use thread locking compound to secure.

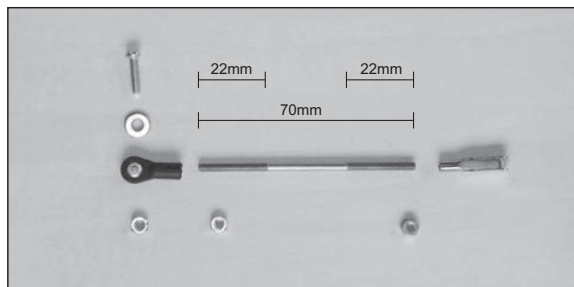
**!** **Note:** The hole on the nylon horn is aligned with the hinge line and pushrod is aligned with the servo arm.



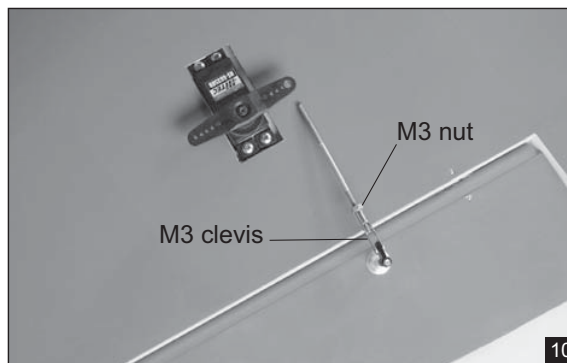
3. Repeat step # 1 - # 2 to install the control horn on the second aileron.

### INSTALLING THE AILERON LINKAGES

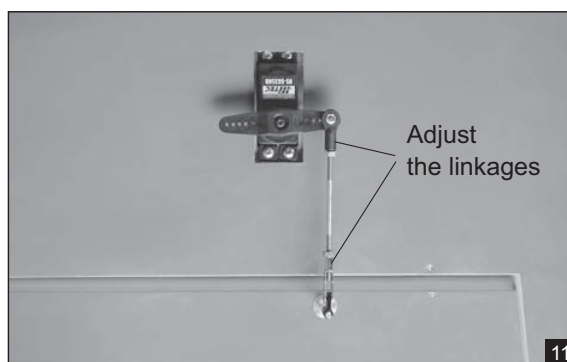
The aileron linkages are assembled as shown below



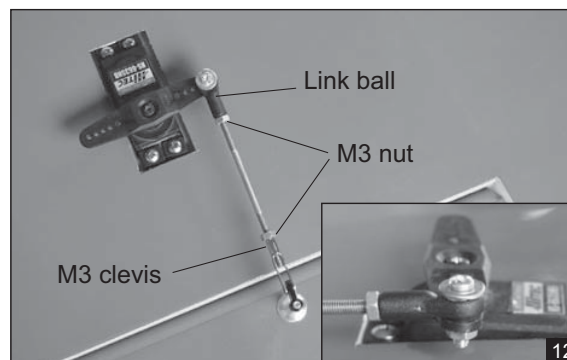
1. Locate the pushrod wire. Slide a silicon clevis retainer onto a clevis. Screw a M3 nut and a threaded metal clevis onto the threaded end of the wire. Tighten the nut against the clevis and then install the clevis on the aileron control horn.



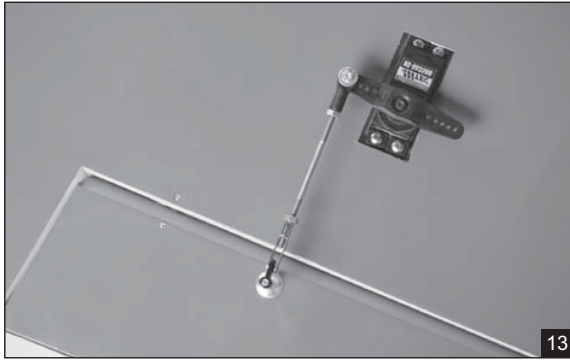
2. Make the same way for the plastic linkball to the other side of the pushrod wire.



3. 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.
4. Center the aileron and hold it in place using a couple of pieces of masking tape. Adjust the linkage until the aileron and the servo arm are both centered and then tighten the nut against the clevis. Install the plastic linkball to the servo arm. Remember use thread locking compound to secure.



5. Repeat step 1 - step 4 for the second aileron linkage.

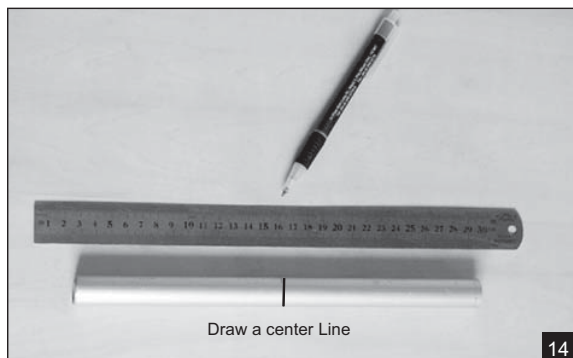


### **INSTALLING THE DIHEDRAL BRACE**

1. Look carefully at the surface of each root rib on both wing halves. Notice how the excess covering material overlaps onto them. Using a modeling knife, carefully cut out away the covering from both root ribs. Iron the covering down so that it does not pull away from the ribs.

**!** *It is important that the excess covering be removed from the root ribs. This will ensure an adequate wood to wood glue joint.*

2. Using a ruler and a pen, locate and mark the center line of the dihedral brace. Draw the vertical line at this location on each side of the brace.



3. Test fit the dihedral brace into the carton tube in each wing half. The brace should slide into each wing half up to the center line. If it does not, remove the brace and lightly sand the edges and tips until the proper fit is obtained.
4. Test fit both of the wing halves together with the dihedral brace temporarily installed. Do not glue it in at this time! The wing halves should fit together tight with little or no gaps in the center section joint. If the center section joint is not tight, remove the wing halves and lightly sand the edges and tips of the dihedral brace. Test fit the wing halves together with the dihedral brace installed again. Repeat until you are satisfied with the fit of the wing halves. The proper dihedral is built into the two root ribs and should not be altered.

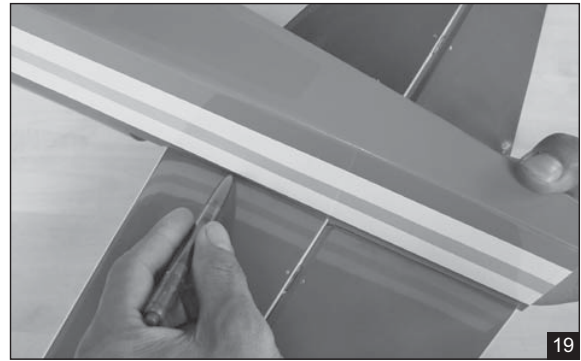
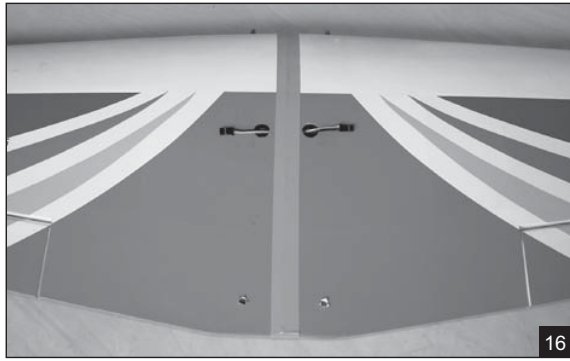
5. When satisfied with the fit of the wing halves, remove the wing halves and the dihedral brace.

### **JOINING THE WING HALVES**

1. Mix a generous amount of 30 minute epoxy. Working with only one wing half for now, apply a thin layer of epoxy inside the carton tube and to only half of the dihedral brace. Make sure to cover the dihedral brace top and bottom as well as the sides, and use enough epoxy to fill any gaps.
2. Slide the dihedral brace into the carton tube up to the center line. Remove any excess epoxy before it dries using a paper towel and rubbing alcohol. Allow the epoxy to cure before proceeding.
3. Once the epoxy has cured, trial fit both wing halves together to double check that the wing halves still fit correctly.
4. Mix a generous amount of 30 minute epoxy. Apply a thin layer of epoxy to the exposed half of the dihedral brace, the inside of the carton tube and the entire surface of both root ribs. Make sure to use enough epoxy to fill any gaps.
5. Slide the two wing halves together and carefully align them at the leading and trailing edges. Wipe away any excess epoxy using a paper towel and rubbing alcohol. Use masking tape to hold the two wing halves in place until the epoxy cures.

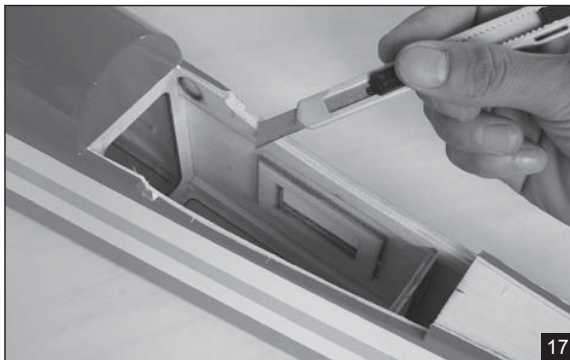


6. When the epoxy has fully cured, double check the center section joint. If any gaps are present, mix a small amount of 30 minute epoxy and carefully fill any remaining gaps. Remove the excess epoxy using a paper towel and rubbing alcohol. Allow the epoxy to fully cure before proceeding.
7. Apply the trim tape to the center section of the wings where they join.



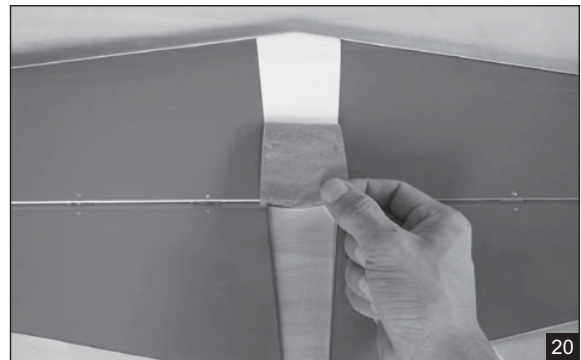
**INSTALLING THE HORIZONTAL STABILIZER**

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

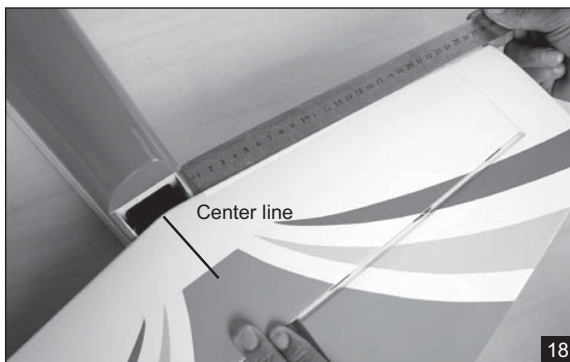


5. Remove the stabilizer. Using the lines you just drew as a guide, carefully remove the covering from between them using a modeling knife.
 

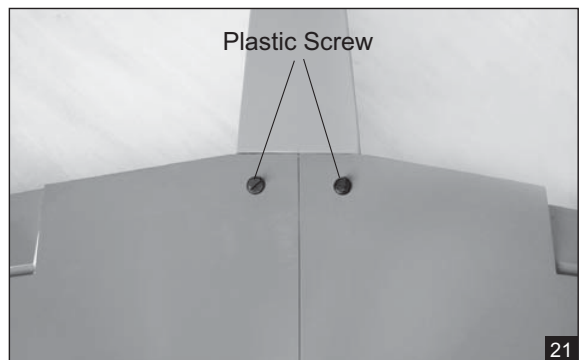
**!** *When cutting through the covering to remove it, cut with only enough pressure to only cut through the covering it's self. Cutting into the balsa structure may weaken it. This could lead to possible failure during flight.*



2. Draw a center line onto the horizontal stabilizer.

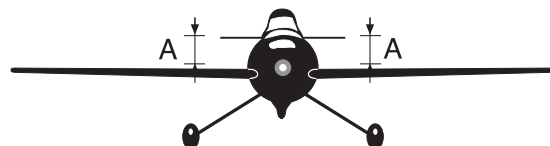


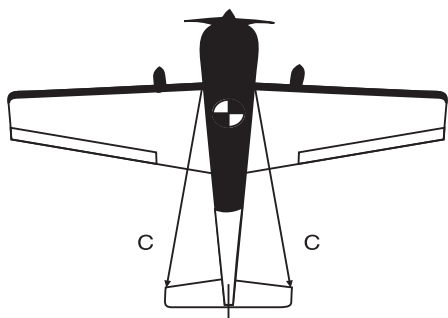
6. Attach the wing to the fuselage as picture.



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 onto the bottom of the tail plane using a water soluble/ non-permanent felt-tip pen.

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





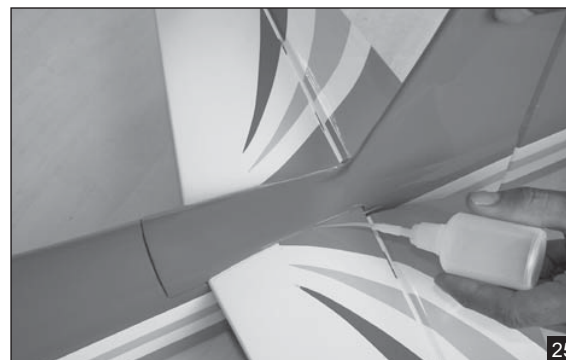
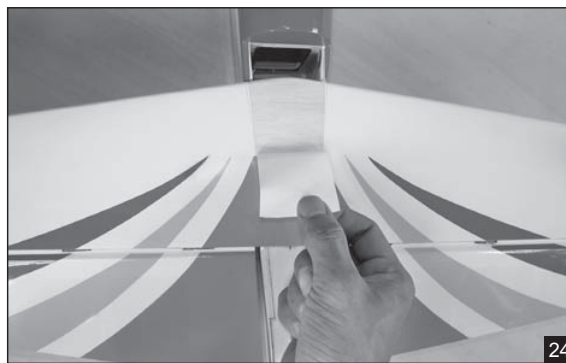
- When you are sure that everything is aligned correctly, mix up a generous amount of 30 minute epoxy. Apply a thin layer to the bottom of the stabilizer mounting area and to the stabilizer mounting platform sides in the fuselage. Insert the stabilizer in place and re-align. Double check all of your 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.



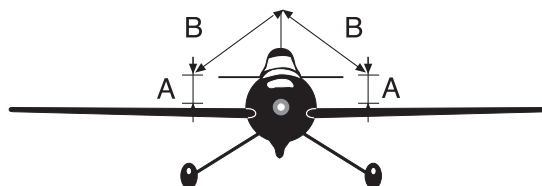
- After the epoxy has fully cured, remove the masking tape or T-pins used to hold the stabilizer in place and carefully inspect the glue joints. Use more epoxy to fill in any gaps that were not filled previously and clean up the excess using a paper towel and rubbing alcohol.

### **INSTALLING THE VERTICAL STABILIZER**

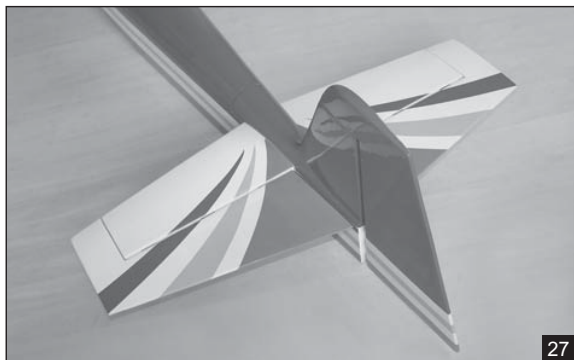
- Using the block of the rudder as a guide and mark the shape of it on the top of the elevator.
- Remove the covering from the elevator and also on the block of rudder.



- Using a triangle, check to ensure that the vertical stabilizer is aligned 90 degree to the horizontal stabilizer.
- 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.

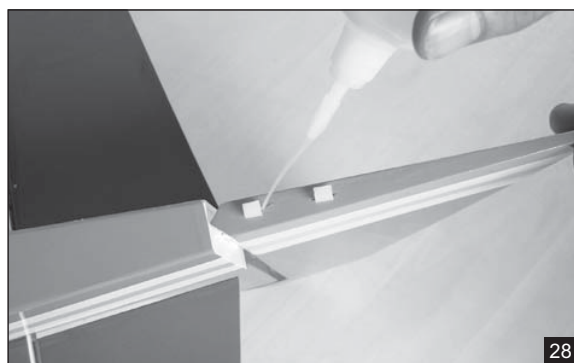




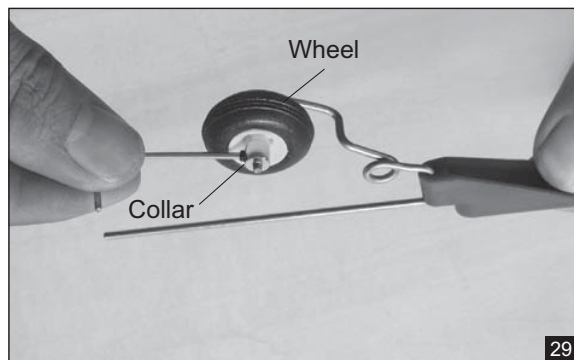


**INSTALLING THE TAIL WHEEL**

1. Using the knife cut away the wood from the bottom of the rudder and slide the two nylon clasps into the slot. Using C.A glue the nylon clasps as shown.

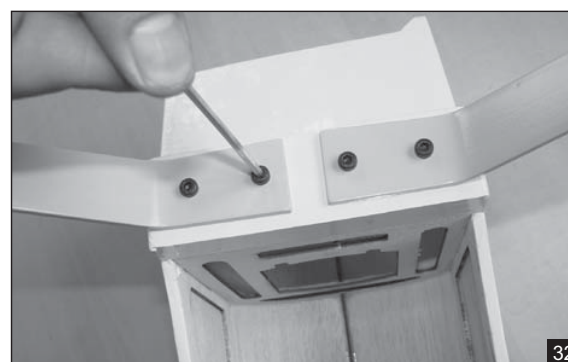


2. Set the tail wheel assembly in place on the plywood plate.
3. Drill 2,6mm pilot holes through the plywood plate.
4. Secure the tail wheel bracket in place using two 3mm x 12mm screw.
5. Align the tail wheel wire so that the wire is parallel with the bottom of the rudder.



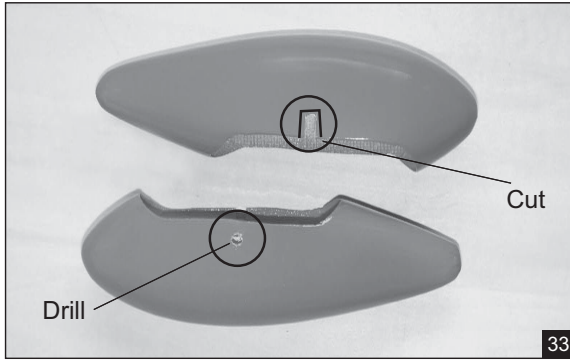
**INSTALLING THE MAIN LANDING GEAR**

1. Nuts have been installed at the factory.
2. Install main landing gear into the fuselage using (4) 4mm x 20mm socket head screws and flat washers provided in the kit.



**INSTALLING THE WHEEL PANTS**

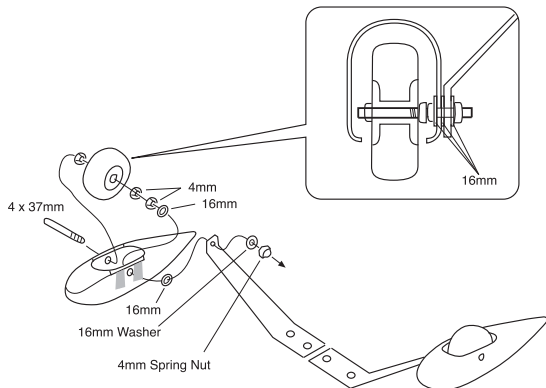
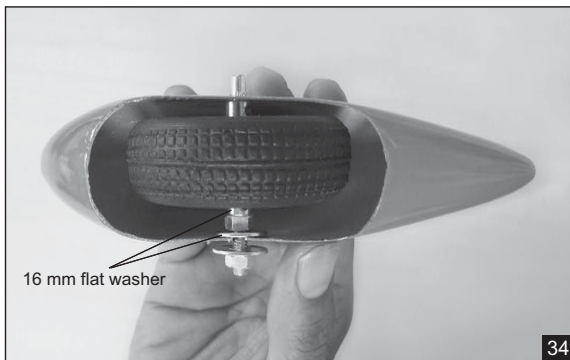
1. Locate the wheel pants from the hardware bag. Mark the locations of the mounting axles onto the wheel pants. The locations of the two mounting holes are the middle of the wheel opening, on right side, left side and 10mm from the bottom of the wheel pant.
2. Using a 5mm drill bit, carefully drill two pilot holes through the wheel pant at the TWO marks you made.



3. Using a modeling knife, carefully cut out two line from the margin of the hole onto the wheel pant. Just cut only one side of the wheel pant, where the main gear will install. Be sure to make a left and right wheel pant.
4. Slide a 4.5mm nut/ three 16mm flat washers /4.5mm nut/ collar/ wheel/ collar onto the axle.
5. Slide the axle assembly into the wheel pant.

**!** *There are just one nut and two flat washers outside of the wheel pant.*

6. Remove one nut, one flat washer. Attach the main landing gear to the axle.
7. Center both collars and wheel in the middle of the wheel pant, lock both collars in place using a hexagon 2mm screw.
8. With the landing gear in place, tighten two nuts.



**!** *After installing the wheel pant, apply a small drop of thin C/A to the bottom nut.*

9. Repeat step # 1-8 to install the second wheel pant assembly.

### INSTALLING THE THROTTLE PUSHROD HOUSING

1. Install the engine mount to the fuselage.



2. Place the engine into the engine mount and align it properly with the front of the cowling. The distance from the firewall to the front of the engine thrust washer should [120mm]

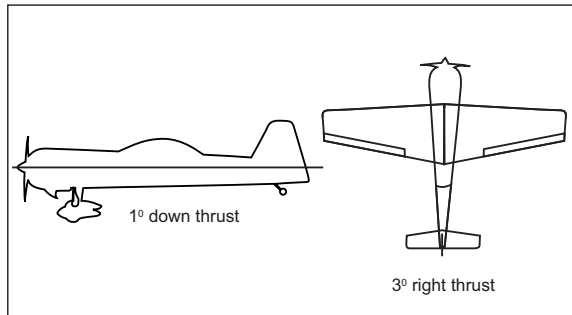
**!** *If your engine is equipped with a remote needle valve, we suggest installing it into the engine at this time.*

3. When satisfied with the alignment of the engine, use a pencil and mark the mounting hole location onto the firewall, where the throttle pushrod will exit.
4. Now, remove the engine. Using a 5mm drill bit, drill holes through the firewall and the forward bulkhead at the marks made.
5. Slide the pushrod housing through the hole in the firewall, through the hole in the forward bulkhead, and into the servo compartment.
6. Apply a couple of drops of thin C/A to the pushrod housing where it exits the firewall and where it passes through the forward bulkhead. This will secure the housing in place.
7. Using a modeling knife, cut off the nylon pushrod housing 26mm in front of the servo tray.

### INSTALLING THE ENGINE

*This manual, we used the OS 75 - two stroke*

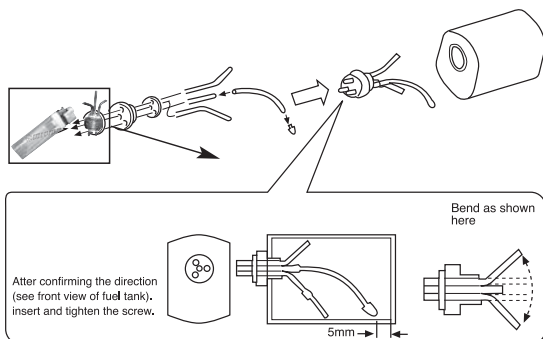
- Locate the long piece of wire used for the throttle pushrod. One end of the wire has been pre-bend in to a "Z" bend at the factory. This "Z" bend should be inserted into the throttle arm of the engine when the engine is fitted onto the engine mount. Fit the engine to the engine mount using the screws provided.



### INSTALLING THE STOPPER ASSEMBLY

1. The stopper has been pre-assembled at the factory.
2. Using a modeling knife, cut one length of silicon fuel line (the length of silicon fuel line is calculated by how the weighted clunk should rest about 8mm away from the rear of the tank and move freely inside the tank). Connect one end of the line to the weighted clunk and the other end to the nylon pick up tube in the stopper.
3. Carefully bend the second nylon tube up at a 45 degree angle (using a cigarette lighter). This tube will be the vent tube to the muffler.
4. Carefully bend the third nylon tube down at a 45 degree angle (using a cigarette lighter). This tube will be vent tube to the fueling valve

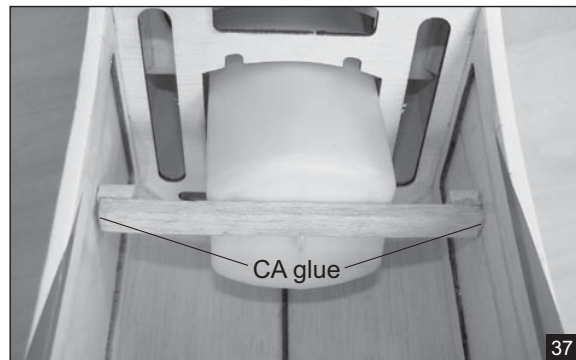
**!** When the stopper assembly is installed in the tank, the top of the vent tube should rest just below the top surface of the tank. It should not touch the top of the tank.



5. Test fit the stopper assembly into the tank. It may be necessary to remove some of the flashing around the tank opening using a modeling knife. If flashing is present, make sure none of it falls into the tank.
6. When satisfied with the alignment of the stopper assembly tighten the 3mm x 20mm machine screw until the rubber stopper expands and seals the tank opening. Do not over tighten the assembly as this could cause the tank to split.
7. Using a modeling knife, cut 3 lengths of fuel line 150mm long. Connect 2 lines to the 2 vent tubes and 1 line to the fuel pickup tube in the stopper.
8. Feed three lines through the fuel tank compartment and through the pre-drilled hole in the firewall. Pull the lines out from behind the engine, while guiding the fuel tank into place. Push the fuel tank as far forward as possible, the front of the tank should just about touch the back of the firewall. Blow through one of the lines to ensure the fuel lines have not become kinked inside the fuel tank compartment. Air should flow through easily.

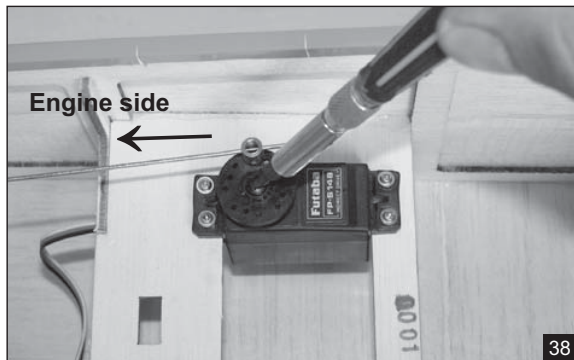
**!** Do not secure the tank into place permanently until after balancing the airplane. You may need to remove the tank to mount the battery in the fuel tank compartment.

9. To secure the fuel tank in place, apply a bead of silicon sealer to the forward area of the tank, where it exits the fuselage behind the engine mounting box and to the rear of the tank at the forward bulkhead.
10. Use hardwood to secure the fuel tank in place by CA glue.



### INSTALLING THE THROTTLE SERVO

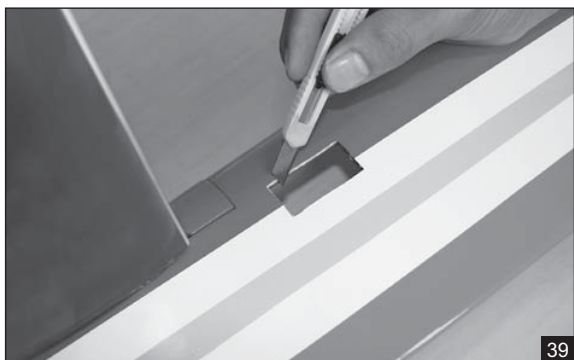
1. Install the rubber grommets and brass collets into the elevator, rudder and throttle servos. Test fit the servos into the servo tray. Trim the tray if necessary to fit your servos
2. Mount the servos to the tray using the mounting screws provided with your radio system.



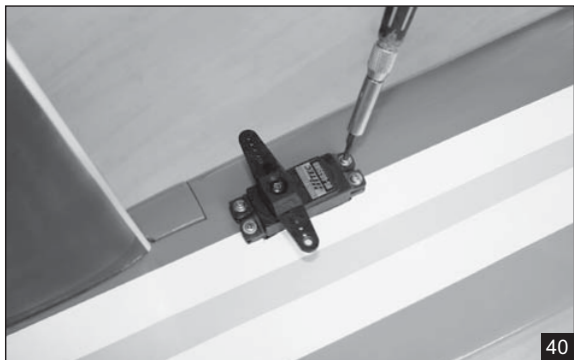
38

**INSTALLING THE ELEVATOR SERVO**

1. Remove the covering from both size of the fuselage.
2. Install two servo to the fuselage as shown.



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3. The elevator has a block wood plate for mounting the control horn. One elevator control horn in positioned on each elevator. 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 elevator at the leading edge, in line with the elevator pushrod.
4. Drill through the mark you made with a (3mm) drill bit. Hard the hole with thin CA. Install the control horn. Remember use thread locking compound to secure.



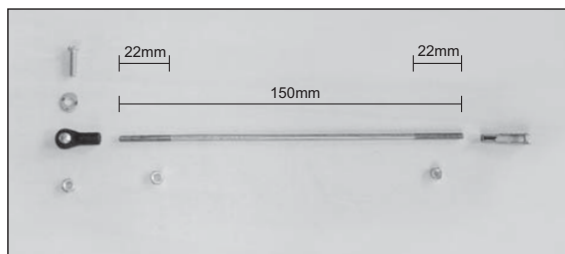
**Note:** The hole on the nylon horn is aligned with the hinge line and pushrod is aligned with the servo arm.



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**INSTALLING THE ELEVATOR LINKAGES**

The elevator linkages are assembled as shown below

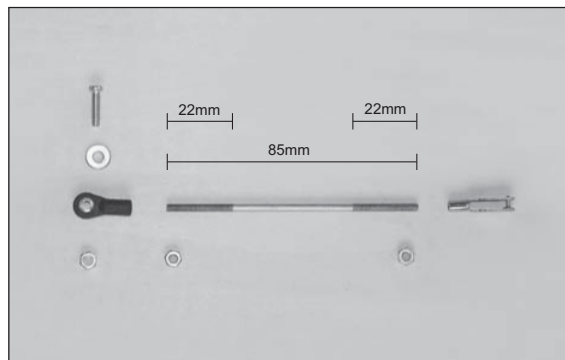


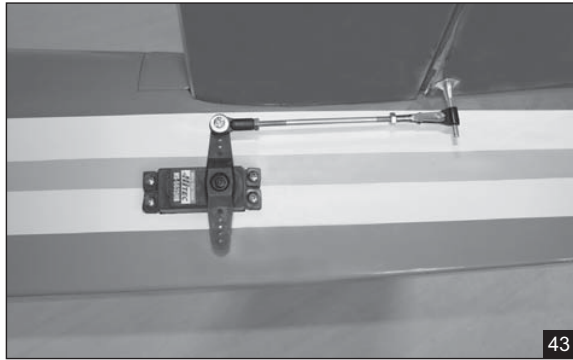
- Repeat these step as installing the aileron linkages (Page 4 and page 5)



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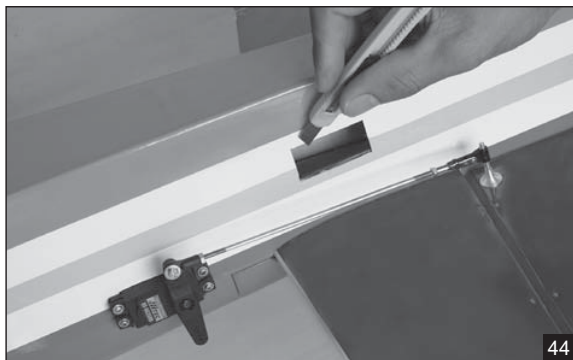
- Repeat these step for the second servo elevator.



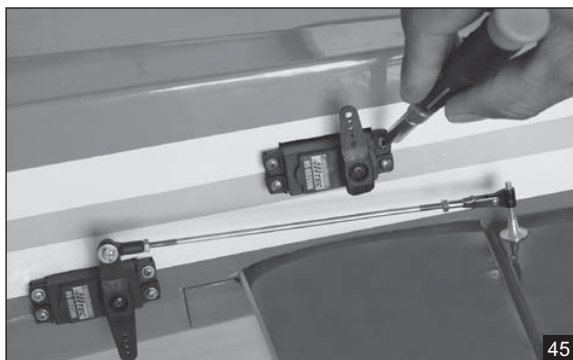


**INSTALLING THE RUDDER SERVO**

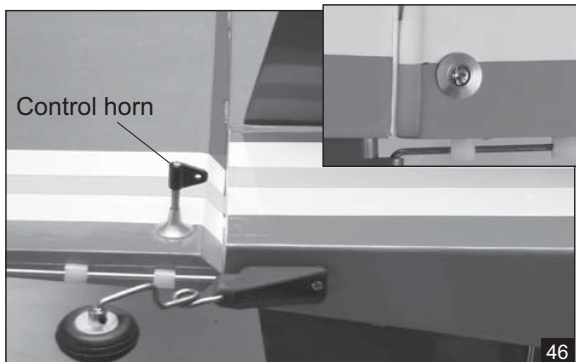
Remove the covering from the exit slot for rudder.



Install the rudder servo to the fuselage as shown.

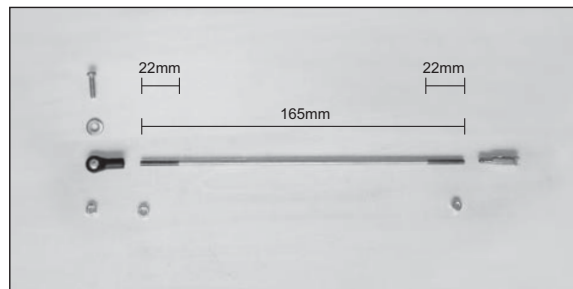


The control horn should be mounted on the right side of the rudder at the leading edge, in line with the rudder pushrod.



**INSTALLING THE RUDDER LINKAGES**

Repeat these step as installing the aileron linkages (Page 4 and page 5).

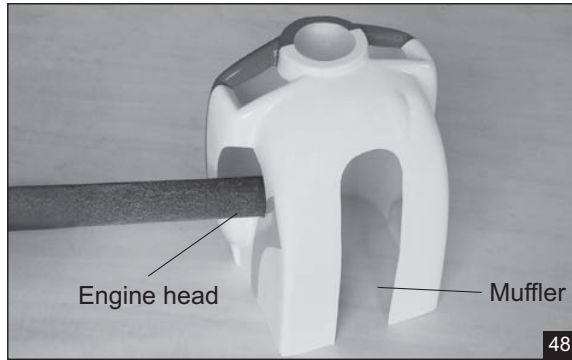


**MOUNTING THE COWL**

1. Remove the muffler and needle valve assembly from the engine. Slide the fiberglass cowl over the engine.
2. Measure and mark the locations to be cut out for engine head clearance, needle valve, muffler. Remove the cowl and make these cut outs using a rotary tool with a cutting disc and a rotary sanding drum attachment.
3. Slide the cowl back into place. Align the front of the cowl with the crankshaft of the engine. The front of the cowl should be positioned so the crankshaft is in the middle of the precut opening. Hold the cowl firmly in place using several pieces of masking tape.
4. While holding the cowl firmly in position, drill four 1,6mm pilot holes through both the cowl and the side edges of the firewall.
5. Using a 3mm drill bit, enlarge the four holes in the cowling.

**!** *Enlarging the holes through the cowl will prevent the fiberglass from splitting when the mounting screws are installed.*

6. Slide the cowl back over the engine and secure it in place using four 3mm x 12mm wood screws.
7. Install the muffler. Connect the fuel and pressure lines to the carburator, muffler and fuel filler valve. Tighten the screws completely.



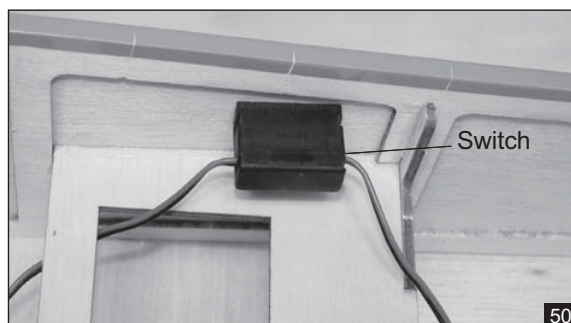
## FINAL ASSEMBLY

### INSTALLING THE SPINNER

- Install the spinner back-plate, propeller and spinner cone. The spinner cone is held in place using two 3mm x 20mm wood screws.
- *The propeller should not touch any part of the spinner cone. If it does, use a sharp modeling knife and carefully trim away the spinner cone where the propeller comes in contact with it.*

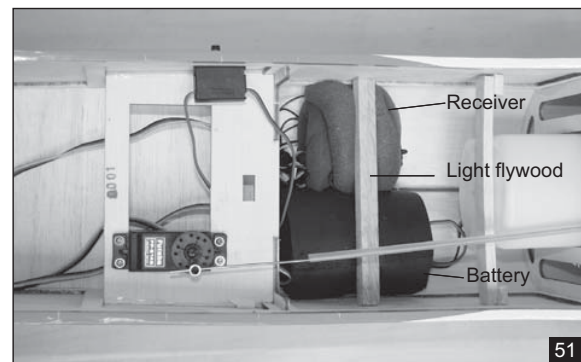
### INSTALLING THE SWITCH

1. The switch should be mounted on the fuselage side, opposite the muffler, close enough to the receiver so the lead will reach. Use the face plate of the switch cut out and locate the mounting holes.
2. Cut out the switch hole using a modeling knife. Use a 2mm drill bit and drill out the two mounting holes through the fuselage side.
3. Secure the switch in place using the two machine screws provided with the radio system.



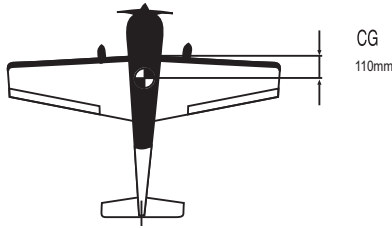
### INSTALLING THE RECEIVER AND BATTERY

1. Plug the servo leads and the switch lead into the receiver. You may want to plug an aileron extension into the receiver to make plugging in the aileron servo lead easier when you are installing the wing. Plug the battery pack lead into the switch.
2. Wrap the receiver and battery pack in the protective foam to protect them from vibration. Use a rubber band or masking tape to hold the foam in place.
3. Position the battery pack and receiver in place and using the two zip ties for mounting them as the picture below.
4. Using a 2mm drill bit, drill a hole through the side of the fuselage, near the receiver, for the antenna to exit.



### 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 110mm BACK FROM THE LEADING EDGE OF THE WING, AT THE FUSELAGE. This location is recommended for initial test flying and trimming. There is a 5mm margin forward and aft. **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 110mm back from the leading edge, at the fuselage sides.
3. Turn the airplane upside down. Place your fingers on the masking tape and carefully lift the plane .
4. 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.

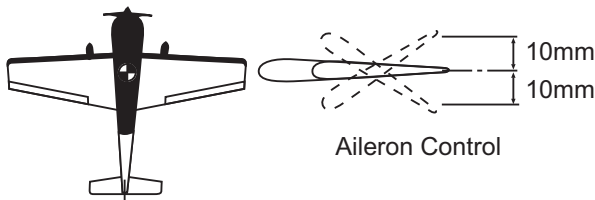
5. Turn the airplane upside down. Attach one loop of heavy string to the engine crankshaft and one to the tail wheel wire. With the wings level, carefully lift the airplane by the string. This may require two people to make it easier.
6. If one side of the wing fall, that side is heavier than the opposite. 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.

● **LOW RATE**

Ailerons : 10mm up	10mm down
Elevator : 12mm up	12mm down
Rudder : 20mm right	20mm left



Aileron Control



Elevator Control



Rudder Control

**3-D PERFORMANCE SETTINGS**

The CAP 232/ 61 will perform 3-D aerobatics easily if you use the largest engines recommended within the engine range. If you setup your airplane to do 3D maneuvers, you will need to be throttle conscious; that is, never apply full throttle on straight and level flying or in dives to prevent flutter.

● **HIGH RATE (FOR 3D)**

Ailerons : 45mm up	45mm down
Elevator : 35mm up	35mm down
Rudder : 45mm right	45mm left

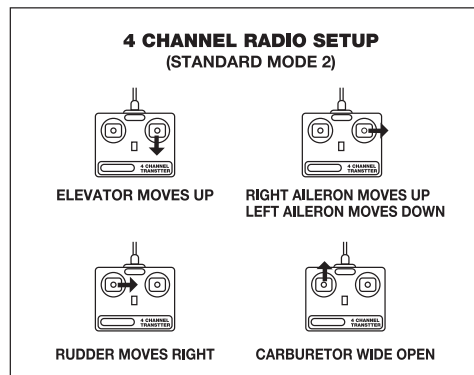
**3D SERVOS**

The large control throws require servos with great centering. The digital servos are second to none in this department. Digital servos such as the Futaba S9250 should be used on all control surfaces of this airplane for optimum performance.

**FLIGHT PREPARATION**

PRE FLIGHT CHECK

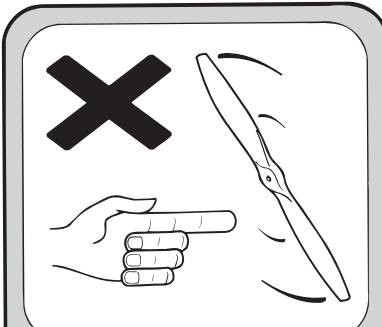
1. Completely charge your transmitter and receiver batteries before your first day of flying.
2. Check every bolt and every glue joint in your plane to ensure that everything is tight and well bonded.
3. Double check the balance of the airplane.
4. Check the control surface.
5. Check the receiver antenna. It should be fully extended and not coiled up inside the fuselage.
6. Properly balance the propeller.



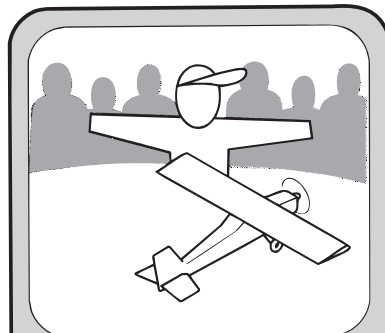
# I/C FLIGHT WARNINGS



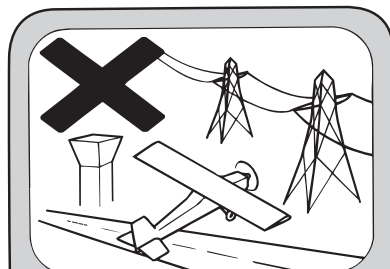
Always operate in open areas, away from factories, hospitals, schools, buildings and houses etc. **NEVER** fly your aircraft close to people or built up areas.



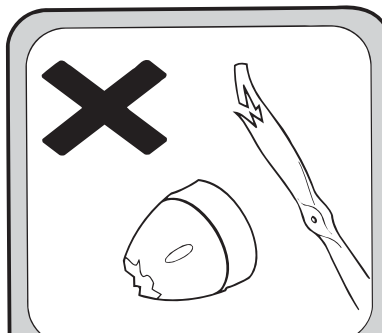
**THE PROPELLER IS DANGEROUS**  
Keep fingers, clothing (ties, shirt sleeves, scarves) or any other loose objects that could be caught or drawn in, away from the propeller. Take care at **ALL** times.



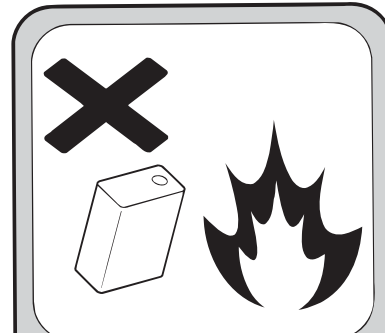
Keep all onlookers (especially small children and animals) well back from the area of operation. This is a flying aircraft, which will cause serious injury in case of impact with a person or animal.



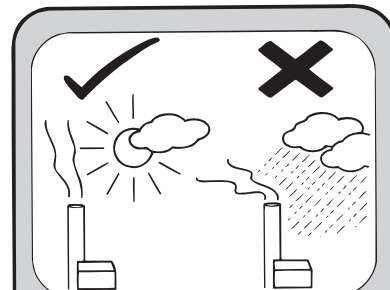
**NEVER** fly near power lines, aerials or other dangerous areas including airports, motorways etc.



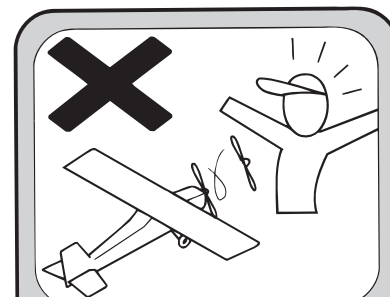
**NEVER** use damaged or deformed propellers or spinners.



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



**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.



# I/C FLIGHT GUIDELINES

