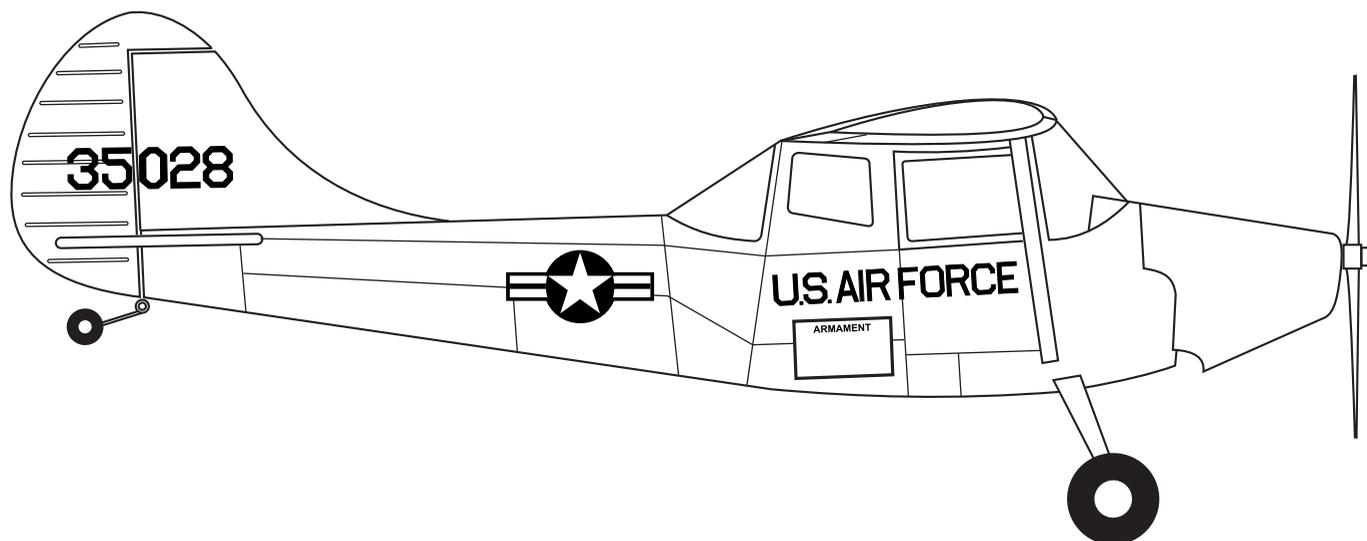


Radio control model / Flugmodell

# L-19/O-1 BIRD DOG

1730mm Wingspan



VQ No: VQA160OL (U.S.ARMY)

VQ No: VQA160G (U.S.AIR FORCE)

ALL Balsa, PLYWOOD CONSTRUCTION AND ALMOST READY TO FLY

## Instruction manual / Montageanleitung

### SPECIFICATIONS

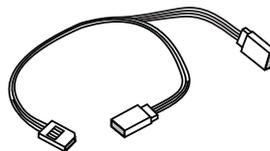
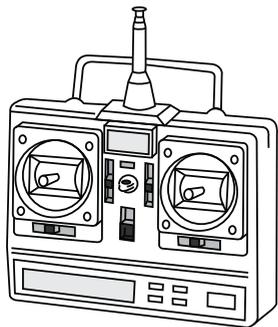
Wingspan:.....1730mm  
Length (installed motor) ..... 1190mm  
Electric Motor:.....800Watt  
Glow Engine:..... .55 2-T / .72 4-T  
RTF Weight: 3100 - 3450g (will vary with  
equipment use).  
Radio:.....6 Channel / 6-7 Servos  
Function: Ailerons-Elevator-Rudder-Throttle  
Flaps.



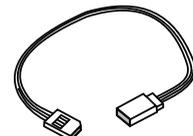
**WARNING!** This radio controlled model is NOT a toy. If modified or flown carelessly it could go out of control and cause serious human injury or property damage. Before flying your airplane, ensure the air field is spacious enough. Always fly it outdoors in safe areas and seek professional advice if you are unexperienced.

**ACHTUNG!** Dieses ferngesteuerte Modell ist KEIN Spielzeug! Es ist für fortgeschrittene Modellflugpiloten bestimmt, die ausreichende Erfahrung im Umgang mit derartigen Modellen besitzen. Bei unsachgemäßer Verwendung kann hoher Personen- und/oder Sachschaden entstehen. Fragen Sie in einem Modellbauverein in Ihrer Nähe um professionelle Unterstützung, wenn Sie Hilfe im Bau und Betrieb benötigen. Der Zusammenbau dieses Modells ist durch die vielen Abbildungen selbsterklärend und ist für fortgeschrittene, erfahrene Modellbauer bestimmt.

## REQUIRED FOR OPERATION (Purchase separately)



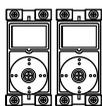
Aileron: "Y"x1pcs



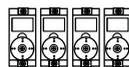
Aileron: 50cmx2 pcs

Flap: 30cmx2 pcs

Rx battery pack: 20cmx1 pcs



Standard



Mini (19g)

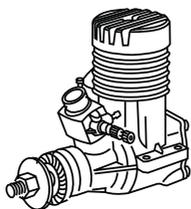
Minimum 6 channel radio  
Elevator : 1 standard servo

Rudder: 1 standard servo

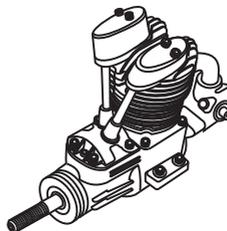
Aileron: 2 mini servo

Flaps: 2 mini servo

Throttle: 1 mini servo (for glow engine only)



.55 - 2 cycle



.62 ~.22 - 4 cycle



800W Brushless Motor



Silicone tube

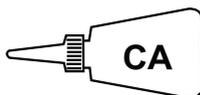


4S 5000mAh LiPo battery

## GLUE (Purchase separately)



Silicon sealer



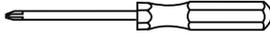
Cyanoacrylate Glue (thin type)



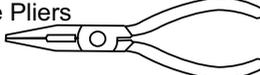
Epoxy Glue  
(30 minute type)

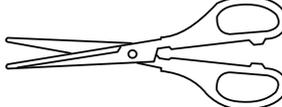
## TOLLS REQUIRED (Purchase separately)

Hobby knife 

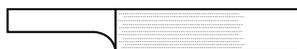
Phillip screw driver 

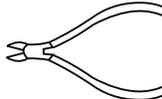
Hex Wrench 

Needle nose Pliers 

Scissors 

Awl 

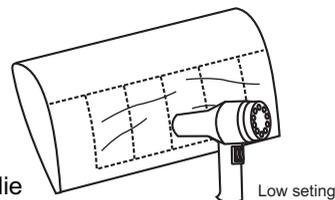
Sander 

Wire Cutters 

Masking tape - Straight Edged Ruler - Pen or pencil - Drill and Assorted Drill Bits

If exposed to direct sunlight and/or heat, wrinkles can appear. Storing the model in a cool place will let the wrinkles disappear. Otherwise, remove wrinkles in covering film with a hair dryer, starting with low temperature. You can fix the corners by using a hot iron.

Bei Sonneneinstrahlung und/oder Wärme kann die Folie erschlaffen bzw. Falten entstehen. Verwenden Sie ein Warmluftgebläse (Haartrockner) um evtl. Falten aus der Folie zu bekommen. Die Kanten können Sie mit einem Bügeleisen behandeln. Nicht zuviel Hitze anwenden !



Low setting

Symbols used throughout this instruction manual, comprise:

 Drill holes using the stated size of drill (in this case 1.5 mm)

 Take particular care here

 Hatched-in areas: remove covering film carefully

 Check during assembly that these parts move freely, without binding

 Use epoxy glue

 Apply cyano glue

 Assemble left and right sides the same way.

 Not included. These parts must be purchased separately

 Löcher bohren mit dem angegebenen Bohrer (hier 1,5 mm)

 Hier besonders aufpassen

 Schraffierte Stellen, Bespannfolie vorsichtig entfernen

 Während des Zusammenbaus immer prüfen, ob sich die Teile auch reibungslos bewegen lassen

 Epoxy-Klebstoff verwenden

 Sekundenkleber auftragen

 Linke und rechte Seite wird gleichermaßen zusammengebaut

 Nicht enthalten. Teile müssen separat gekauft werden.

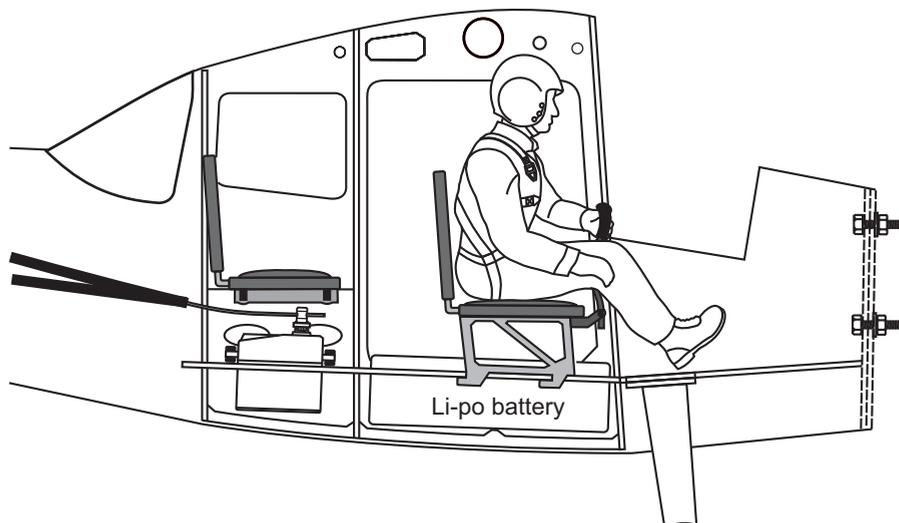
Read through the manual before you begin, so you will have an overall idea of what to do.

## CONVERSION TABLE

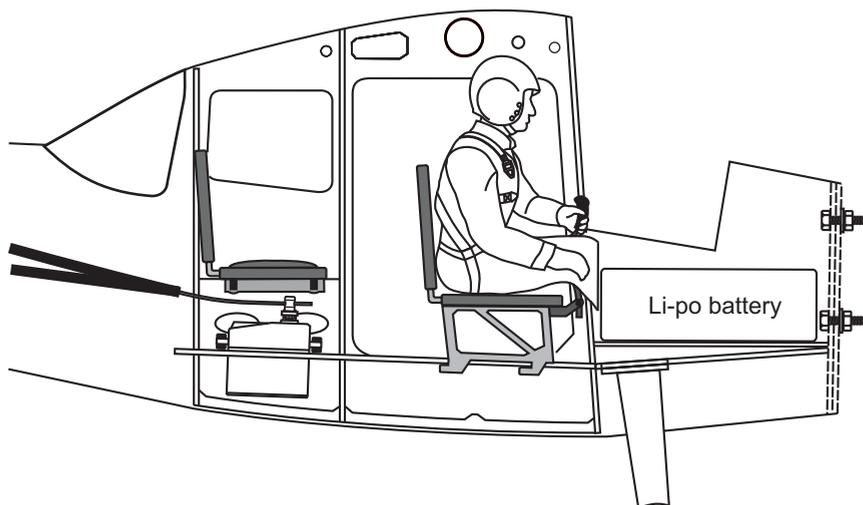
1.0mm = 3/64"	3.0mm = 1/8"	10mm = 13/32"	25mm = 1"
1.5mm = 1/16"	4.0mm = 5/32"	12mm = 15/32"	30mm = 1-3/16"
2.0mm = 5/64"	5.0mm = 13/64"	15mm = 19/32"	45mm = 1-51/64"
2.5mm = 3/32"	6.0mm = 15/64"	20mm = 51/64"	

BEFORE STARTING ASSEMBLING, YOU NEED TO CHOOSE ONE OF THE FOLLOWING THERE WAYS:

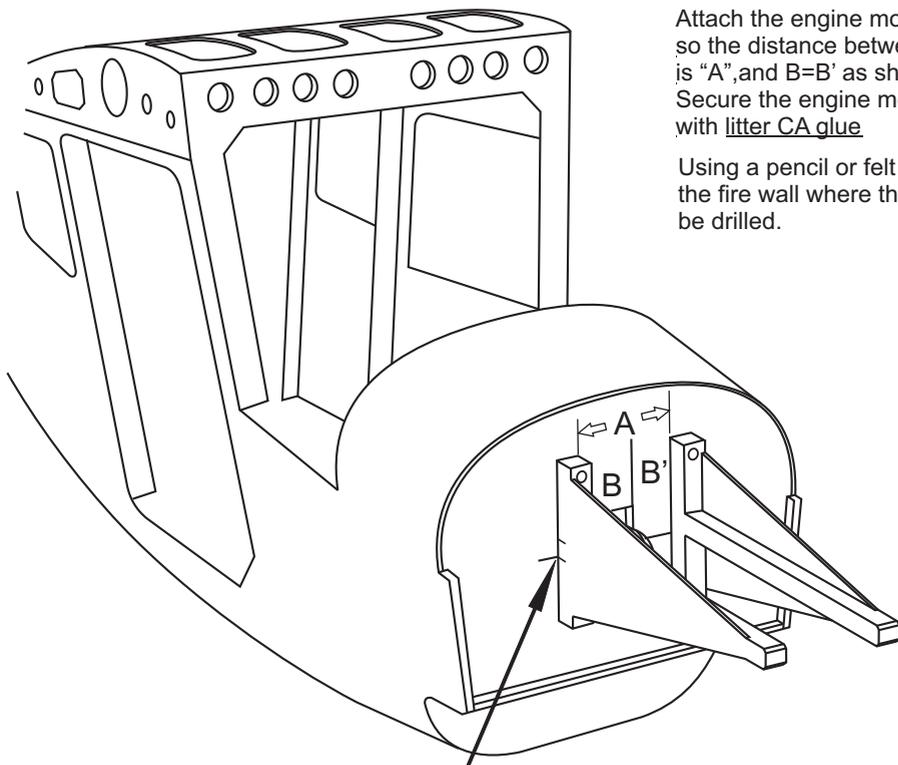
- 1- Fly with Glow Engine: With this way, the ready to fly weight approx 3100grs, depending on glow engine type.
- 2- Fly with Electric motor (with scale pilot figure **with two legs**): With this way, the Li-po battery is located under front pilot's seat.  
Ready to fly weight approx 3450grs. (already 350gr of ballast in the nose of model).



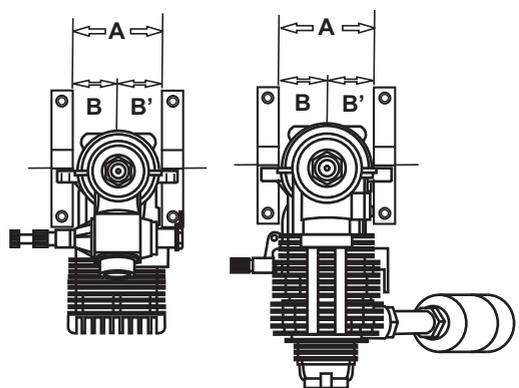
- 3- Fly with Electric motor (with scale pilot figure **without legs**): With this way, the ready to fly weight approx 3100grs, depending on electric motor type.



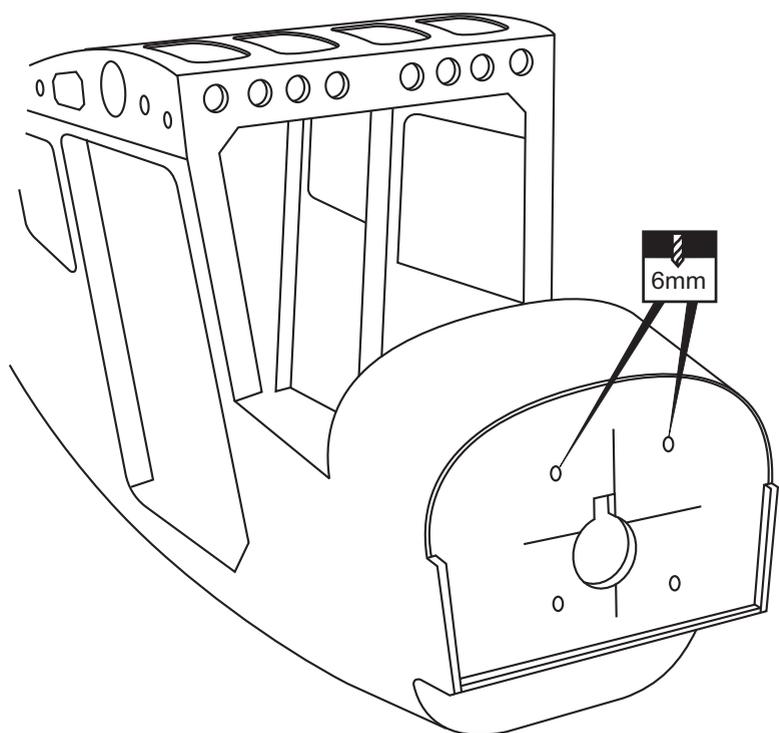
# L-19 BIRD-DOG 1- GLOW ENGINE INSTALLATION



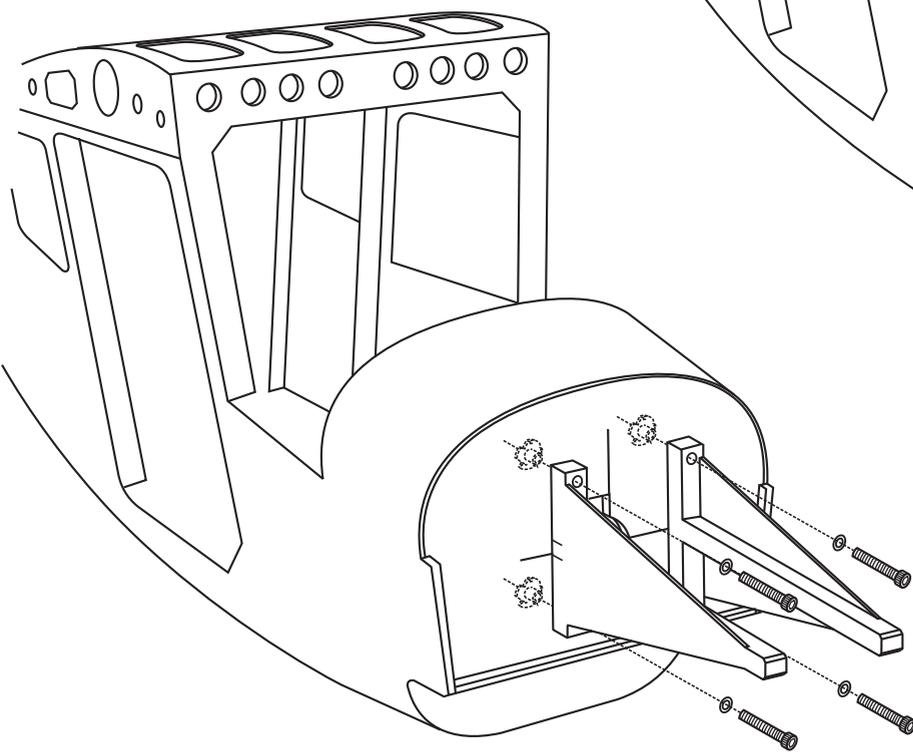
Attach the engine mount beams onto the fire-wall so the distance between of two engine mount beams is "A", and B=B' as show.  
 Secure the engine mount beams onto the fire-wall with litter CA glue  
 Using a pencil or felt tipped pen, mark the fire wall where the four holes are to be drilled.



! Align the mark on both engine mount beams with the mark on the fuselage



Carefully remove the engine mount beams and drill a 6mm hole through the fire-wall at each of the four marks made above.

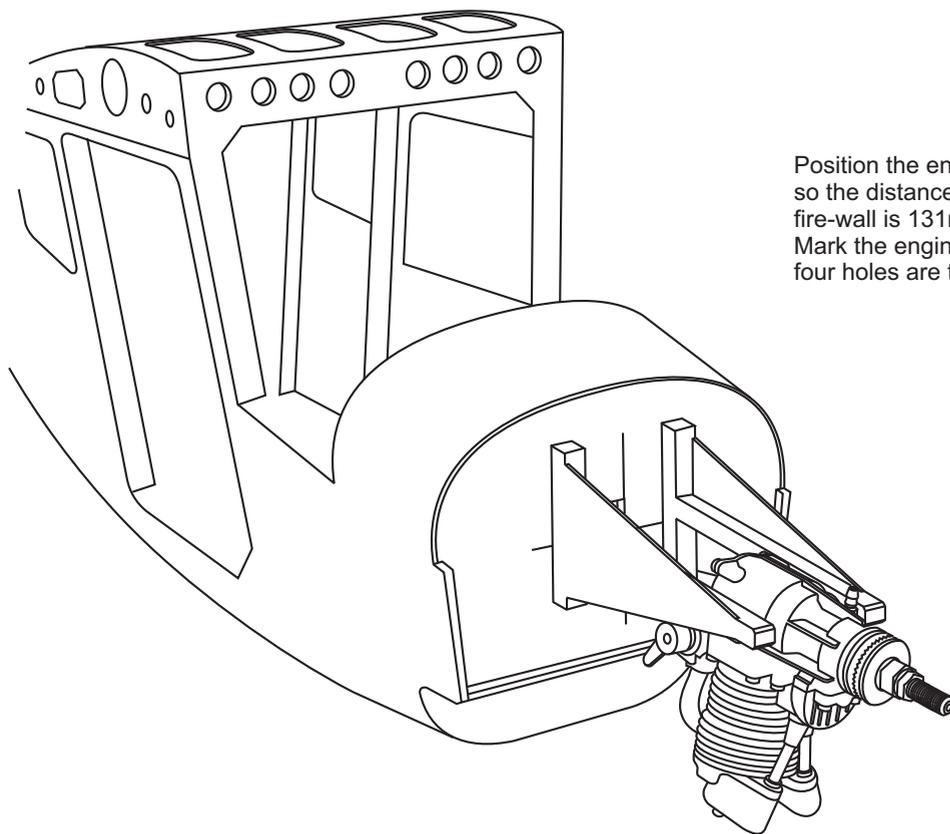


Insert the blind-nut onto each of the four holes make above.

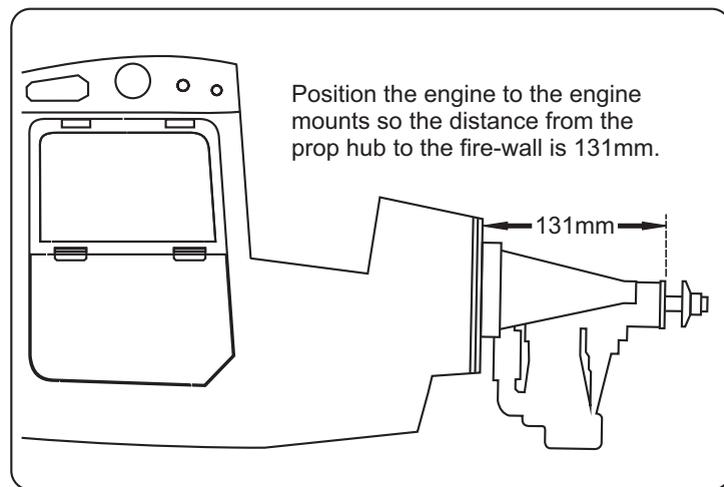
Reposition the engine mount beams on to the fire-wall and secure them with four 4x25mm screws.

4x25mm screw - washer		4
Blind-nut		4

# L-19 BIRD-DOG 2- GLOW ENGINE INSTALLATION

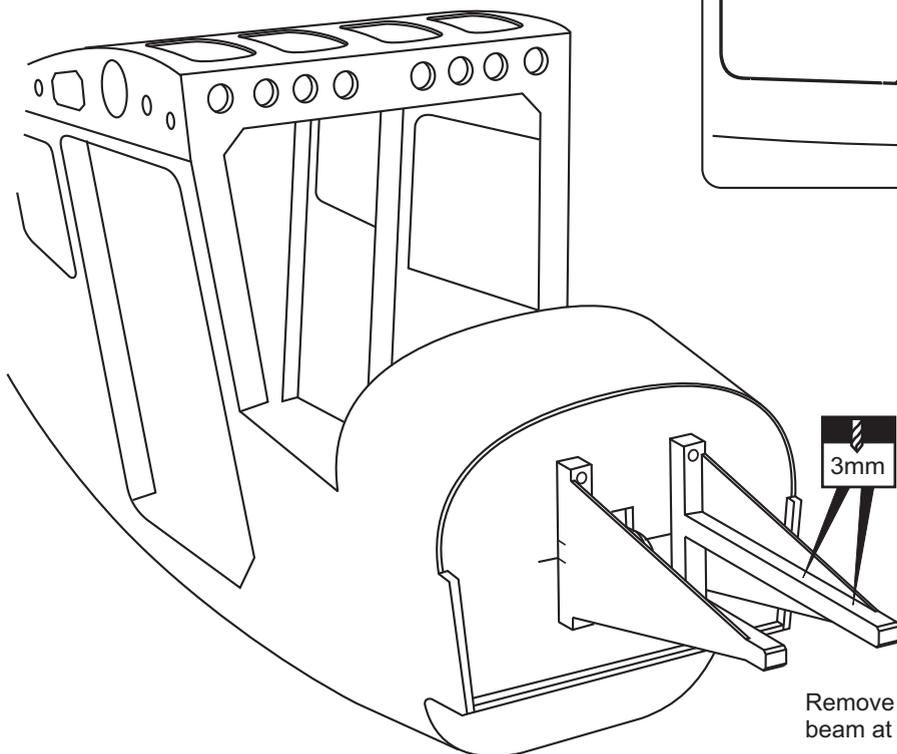


Position the engine to the engine mounts so the distance from the prop hub to the fire-wall is 131mm.  
Mark the engine mount beams where the four holes are to be drilled.



Position the engine to the engine mounts so the distance from the prop hub to the fire-wall is 131mm.

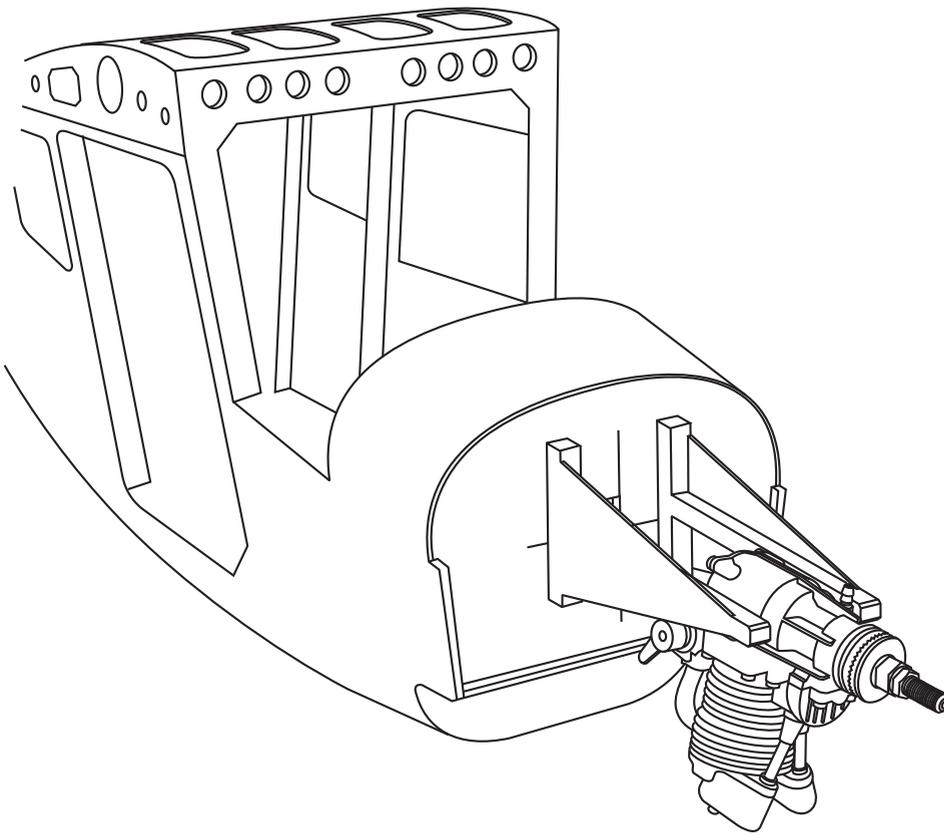
131mm



Remove the engine and drill a 3mm holes through the beam at each of the four marks made above.

Marking sure that you drill the hole perpendicular to the beam of the engine mount.

# L-19 BIRD-DOG 3- GLOW ENGINE INSTALLATION

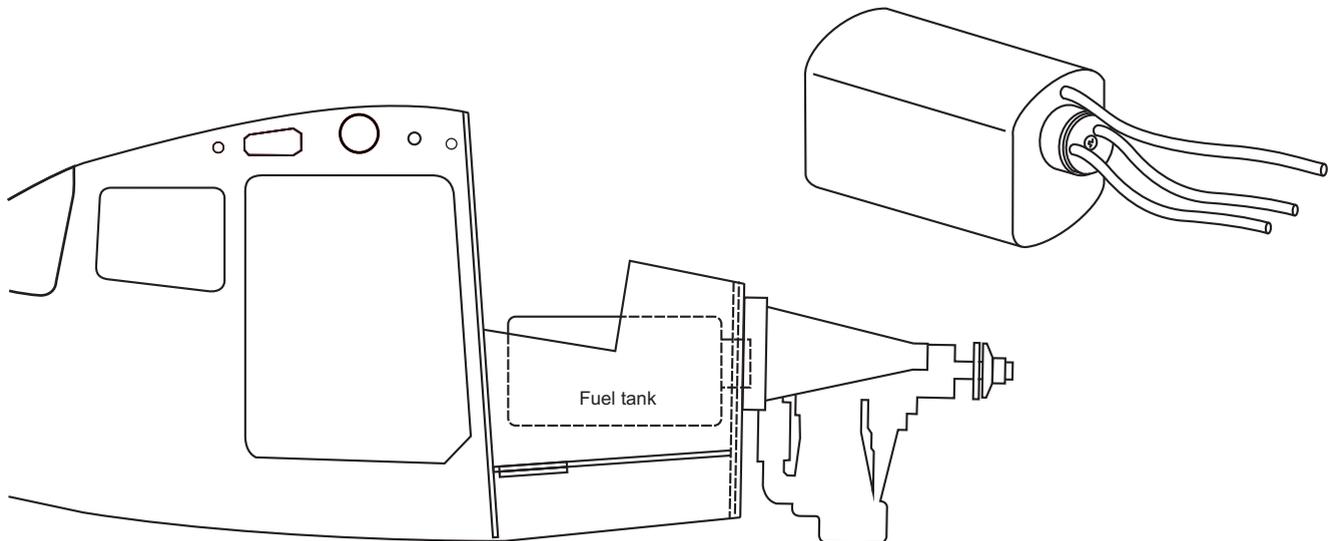
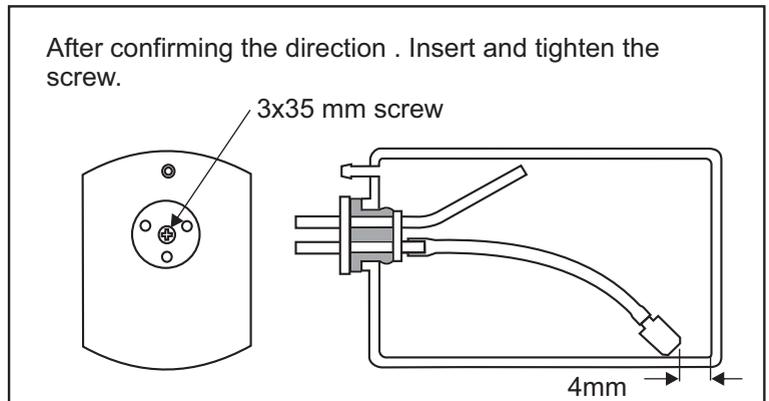
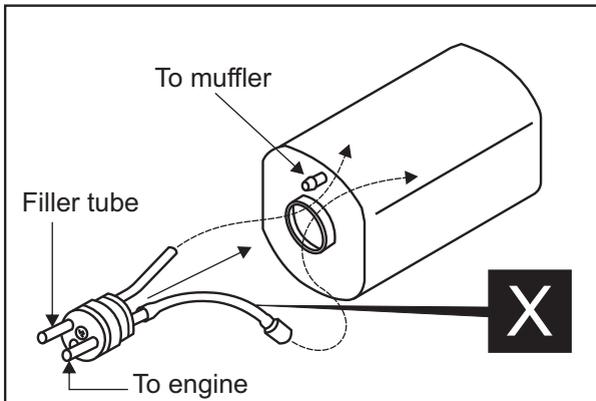


Reposition the engine on the engine mount beams, aligning it with the holes. Secure the engine to the engine mount using four 3x25mm screws.

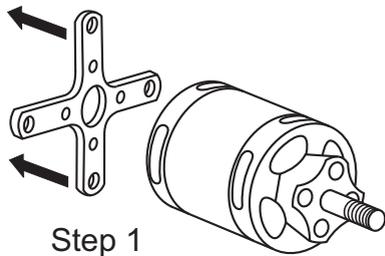
Note: Apply Silicon sealer to each of the 3x25mm screw and nut.

3x25mm screw	.....4
Washer	.....4

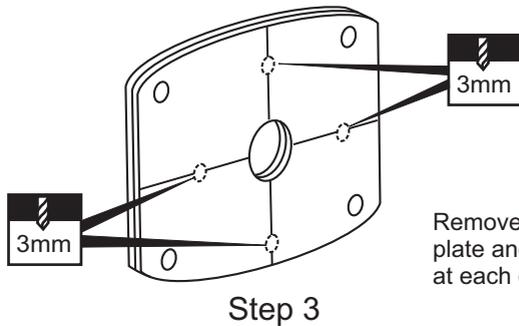
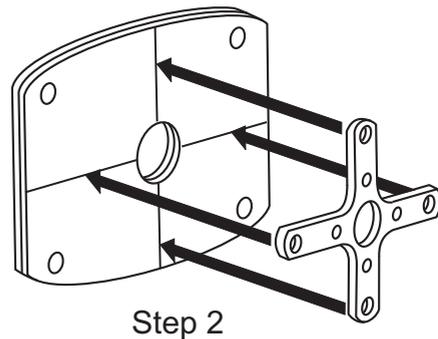
# L-19 BIRD-DOG 4- FUEL TANK



# L-19 BIRD-DOG 5- ELECTRIC MOTOR INSTALLATION

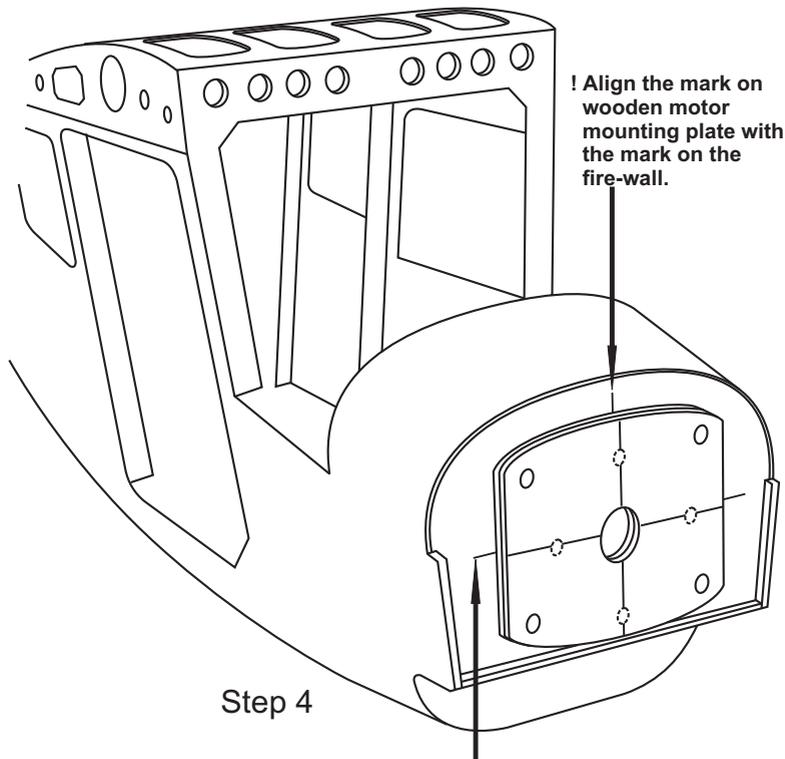


Using a aluminum motor mounting plate as a template, mark the plywood motor mounting plate where the four holes are to be drilled.

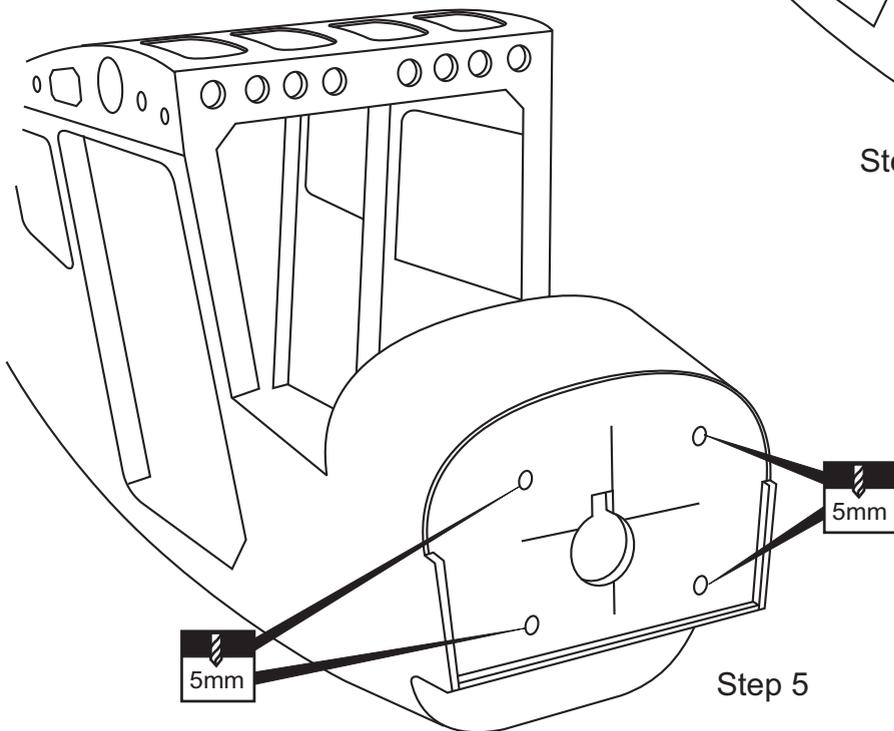


Remove the aluminum motor mounting plate and drill a 3mm hole through the plywood at each of the four marks marked .

Using a wooden motor mounting plate as a template, mark the fire-wall where the four holes are to be drilled.



! Align the mark on wooden motor mounting plate with the mark on the fire-wall.

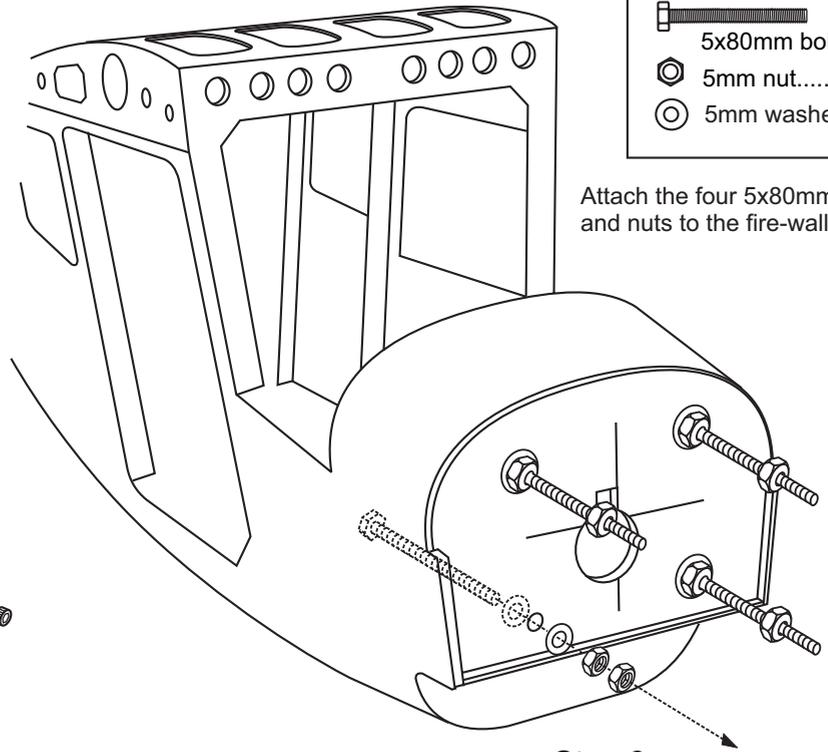


Remove the wooden motor mounting plate and drill a 5mm hole through the fire-wall at each of the four marks marked .

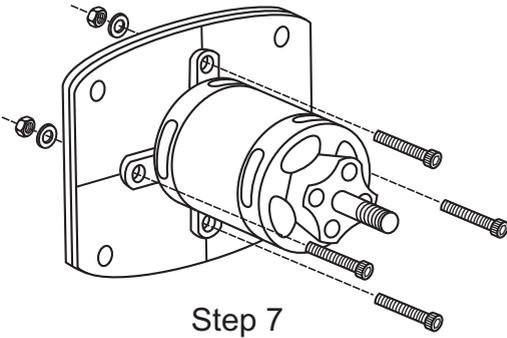
# L-19 BIRD-DOG 6- ELECTRIC MOTOR INSTALLATION

-  5x80mm bolt....4
-  5mm nut.....12
-  5mm washer...16

Attach the four 5x80mm bolts and nuts to the fire-wall as shown.



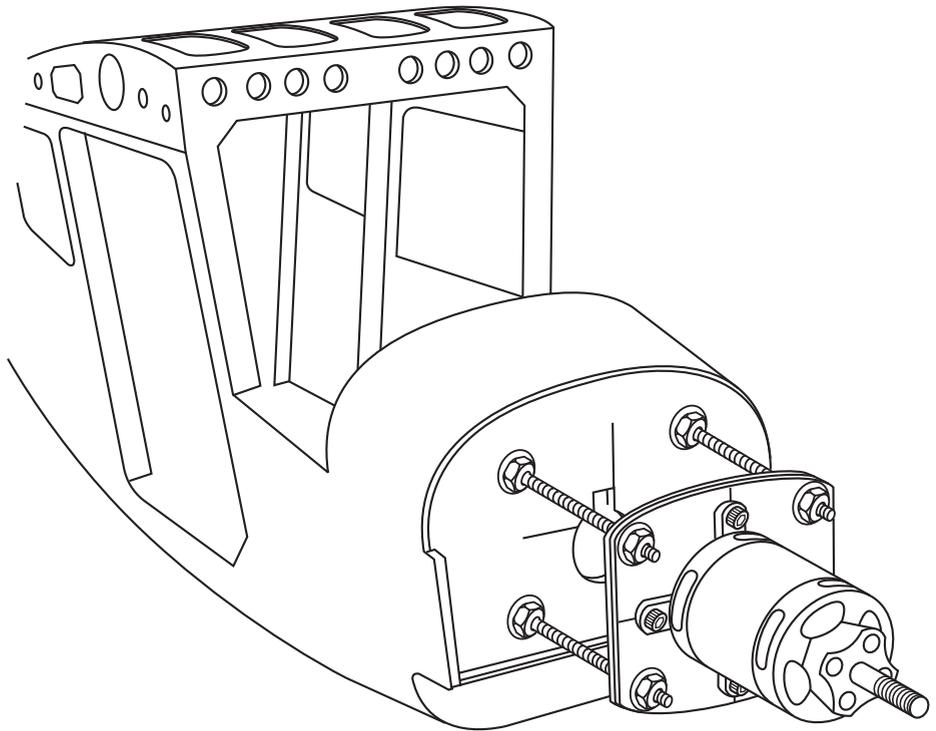
Step 6



Step 7

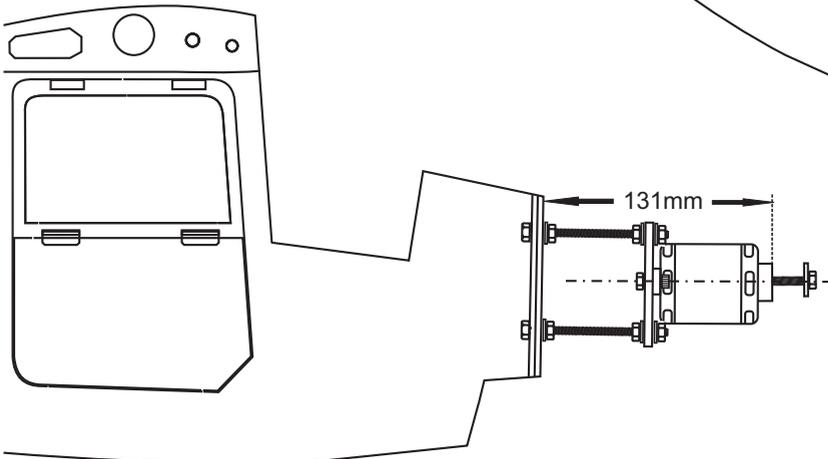
-  
- 3mm bolt / nut...4

Secure the Motor to the wooden motor mounting plate using the four 3mm bolts.



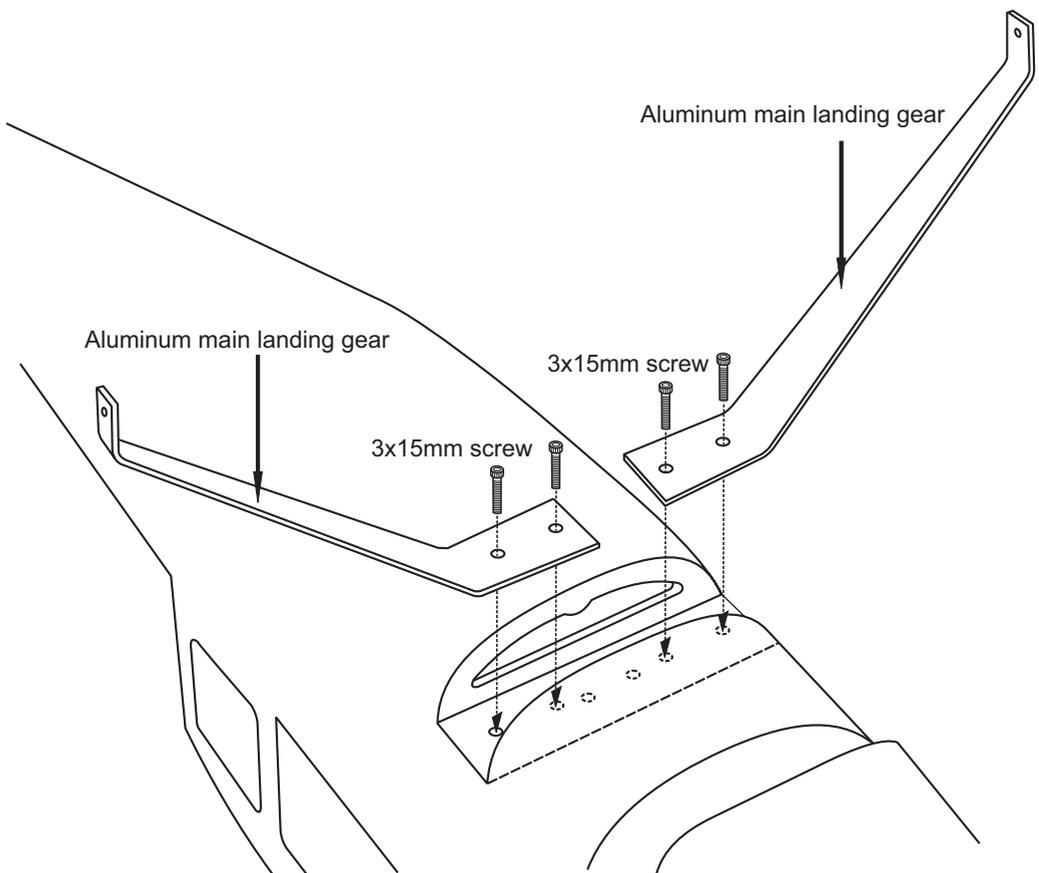
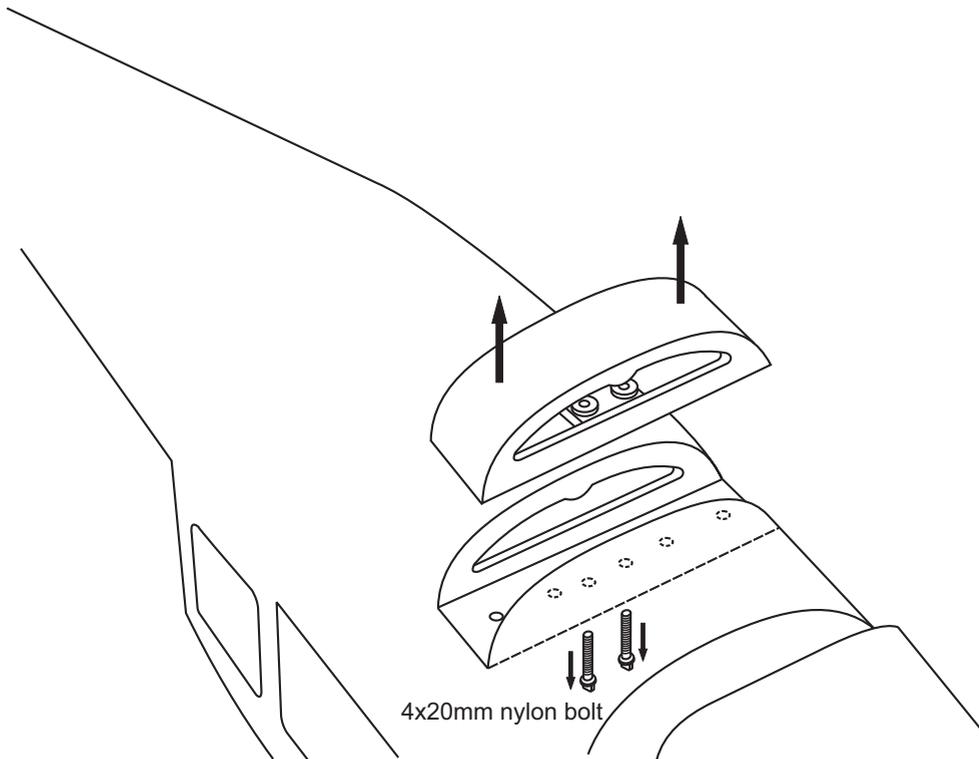
Step 8

Adjust the wooden motor mount so the distance from the prop hub to the fire-wall is 131mm.



# L-19 BIRD-DOG 7- MAIN LANDING GEAR INSTALLATION

4x20mm nylon bolt  
.....2



3x15mm screw  
.....4



4x20mm nylon bolt



75mm wheel



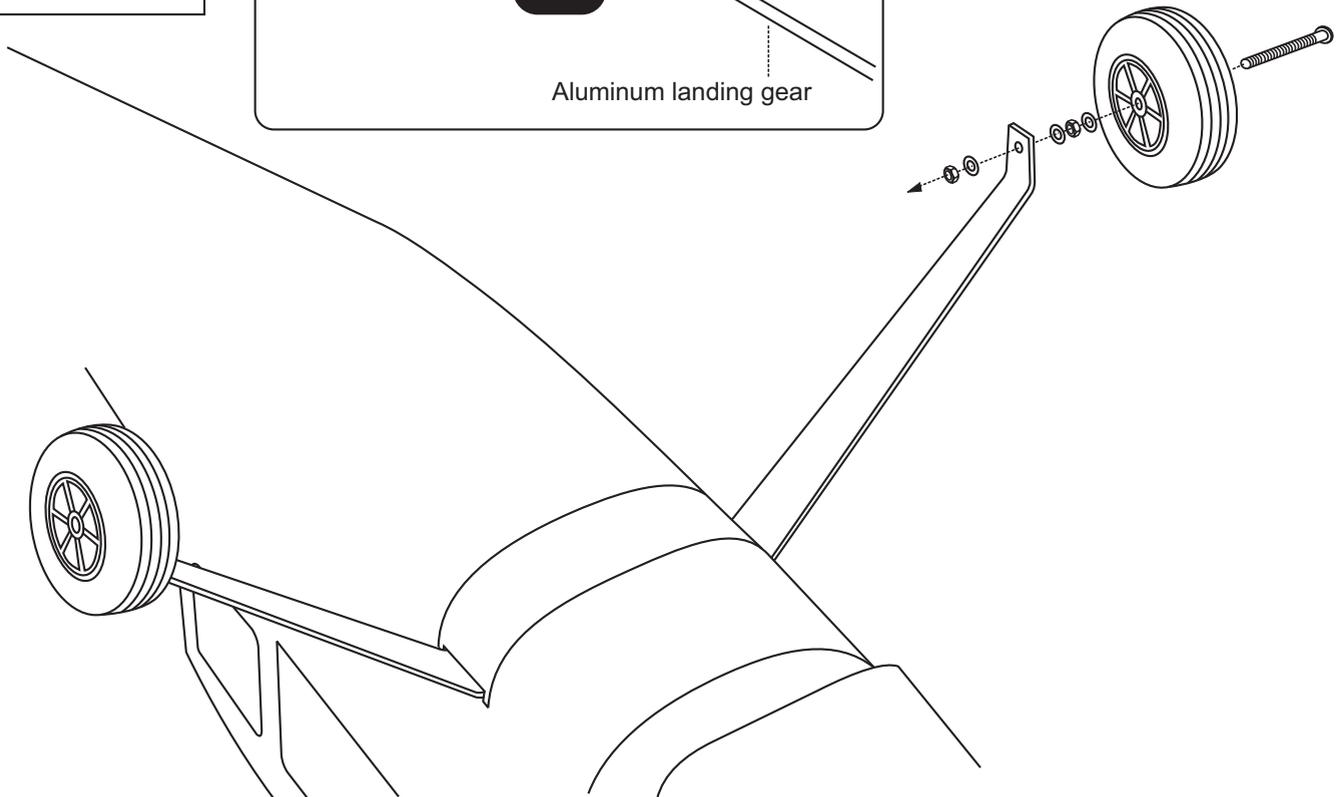
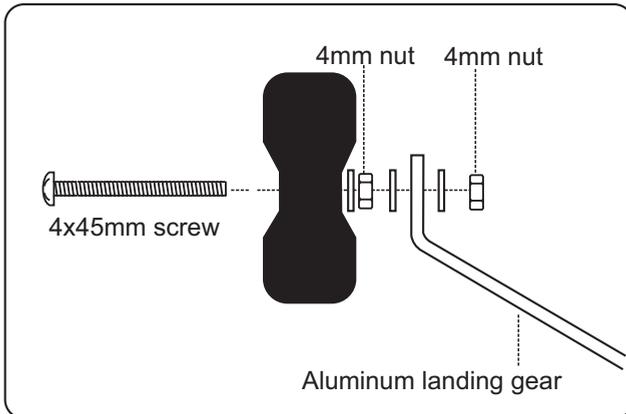
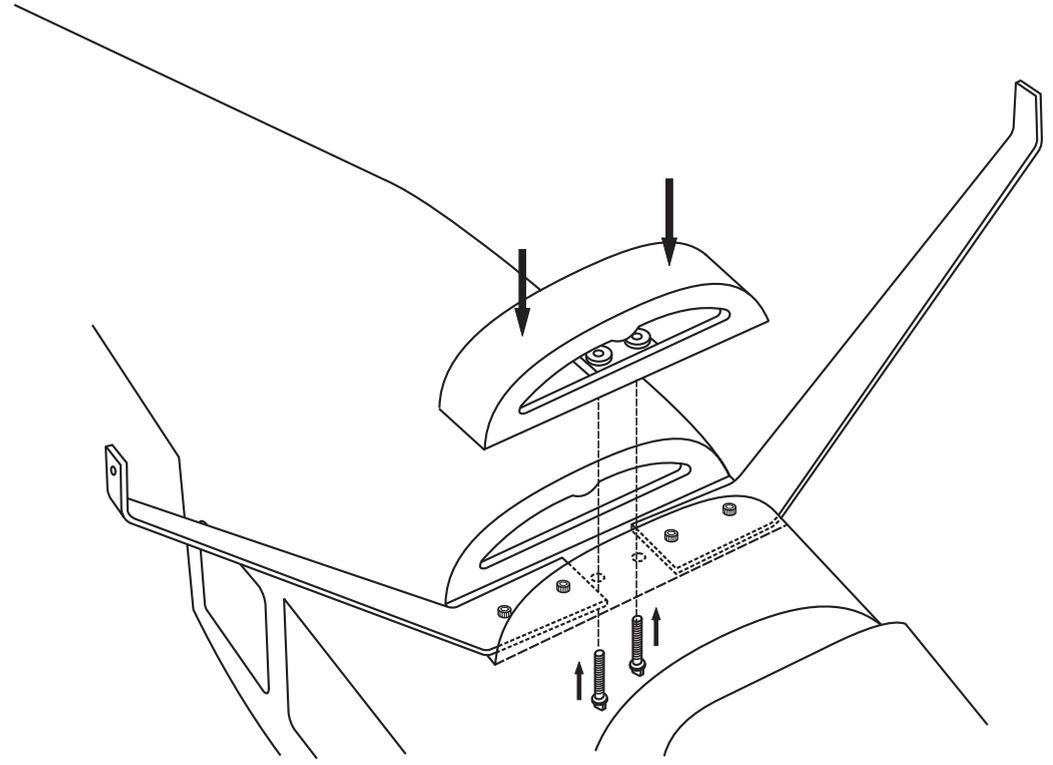
4x45mm screw



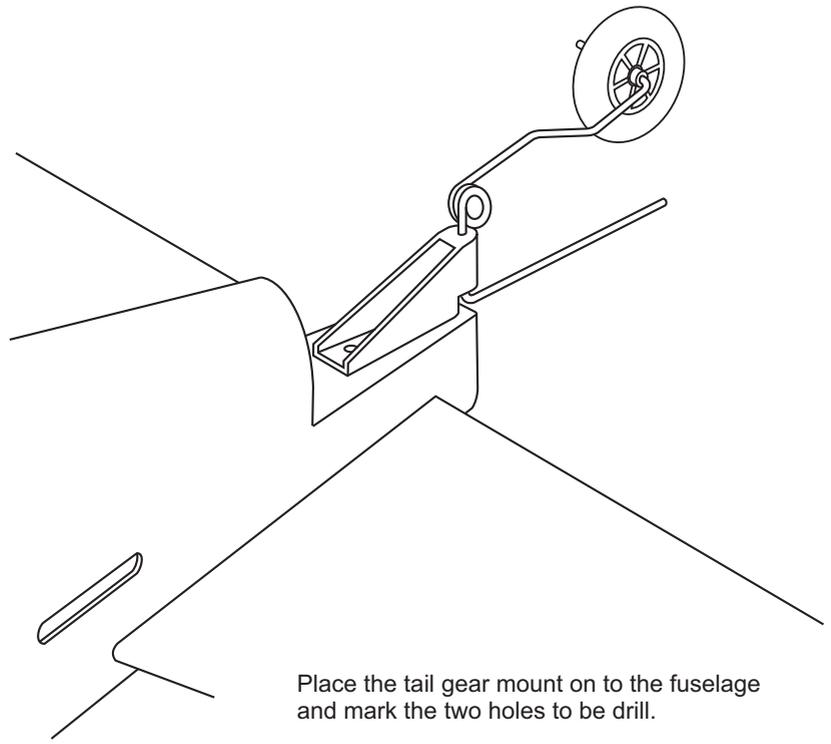
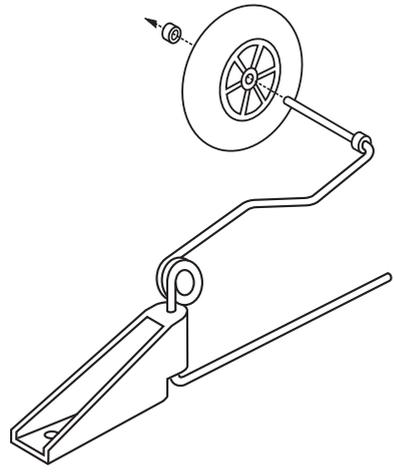
4mm nut



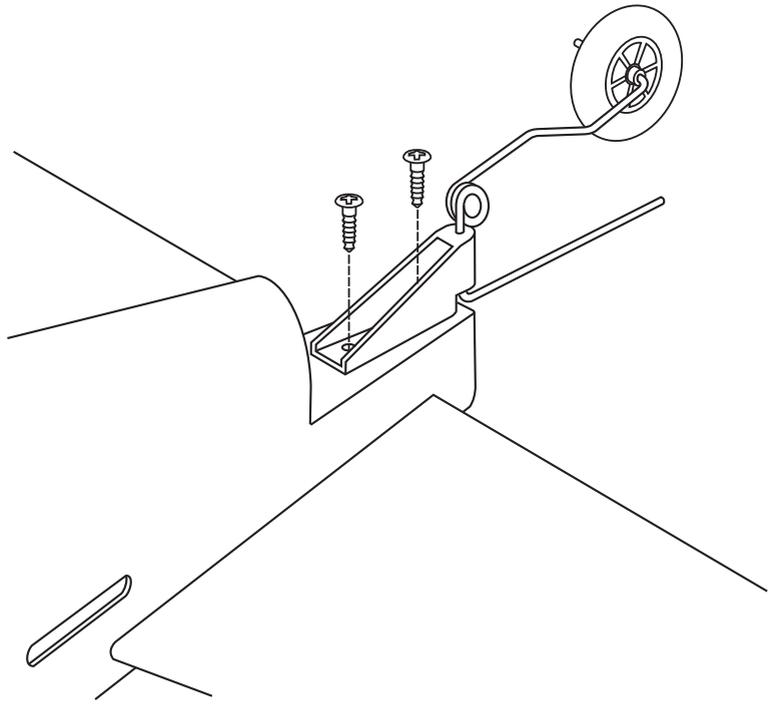
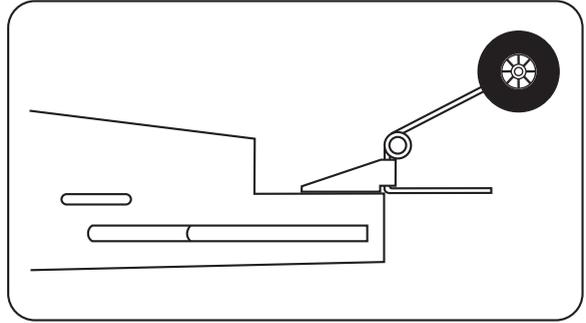
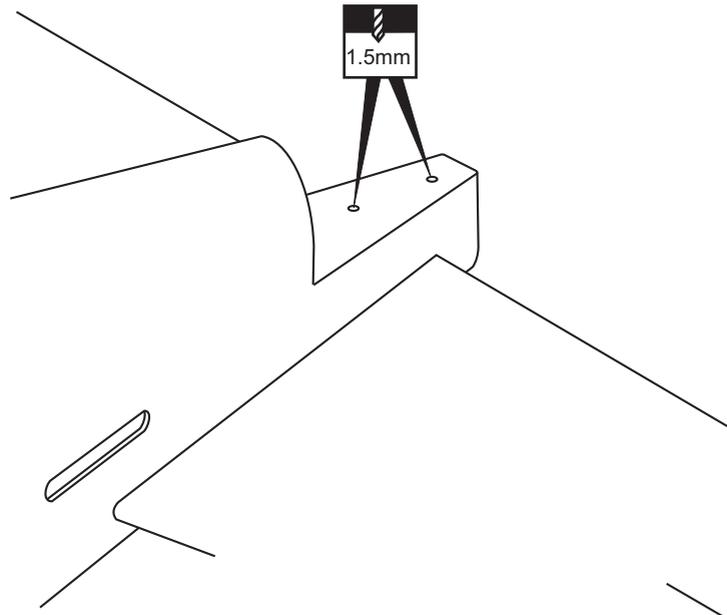
4mm washer



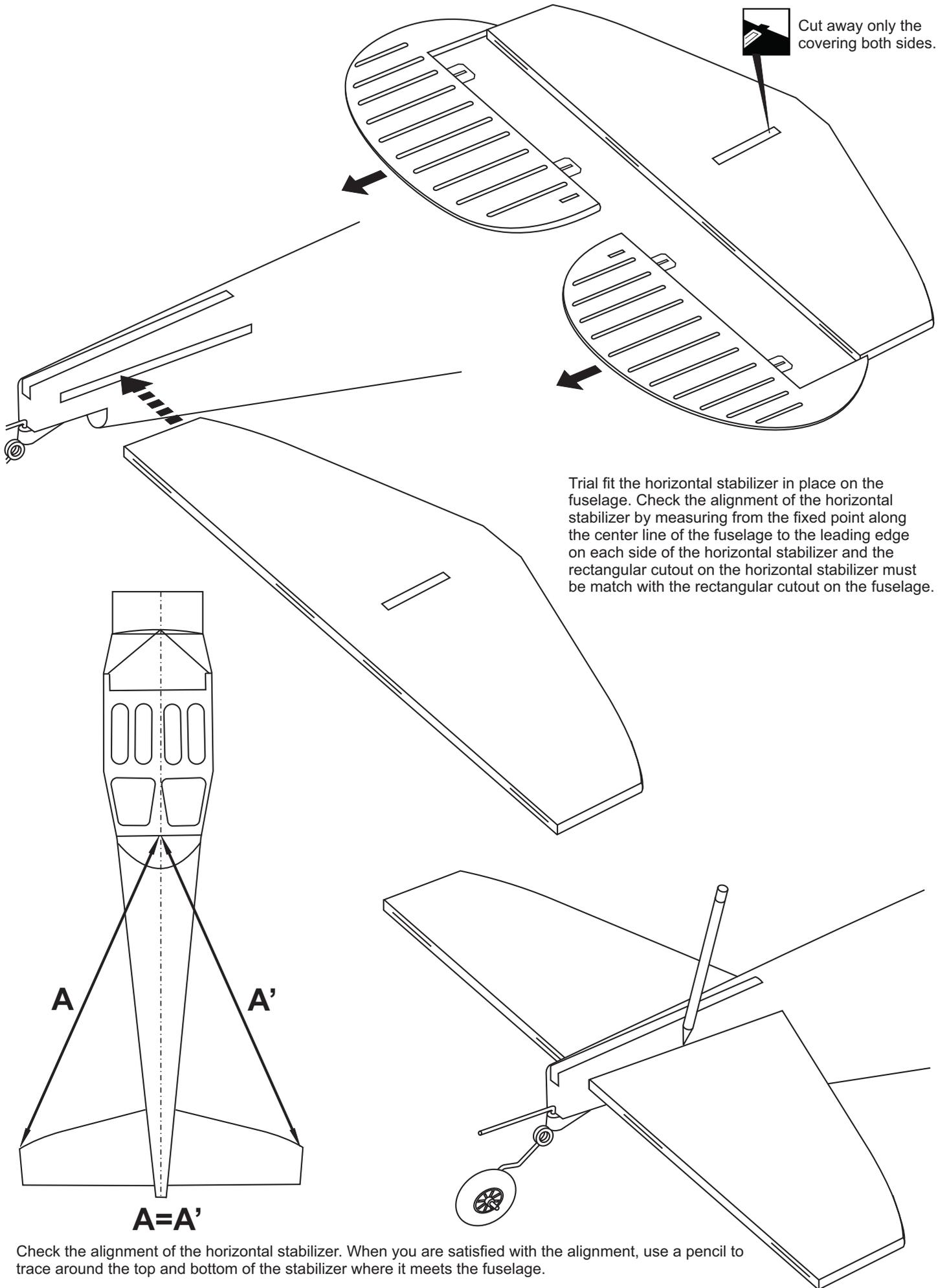
# L-19 BIRD-DOG 9- TAIL GEAR INSTALLATION



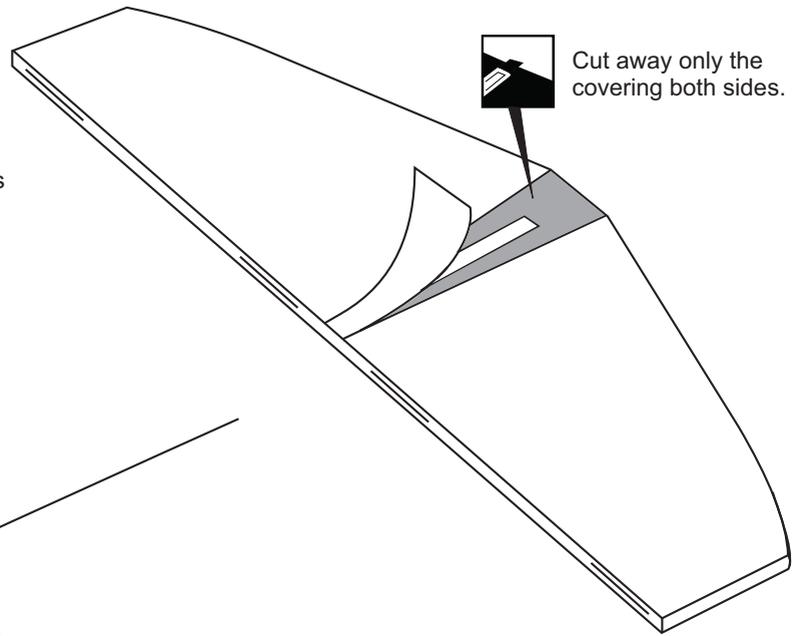
Place the tail gear mount on to the fuselage and mark the two holes to be drill.



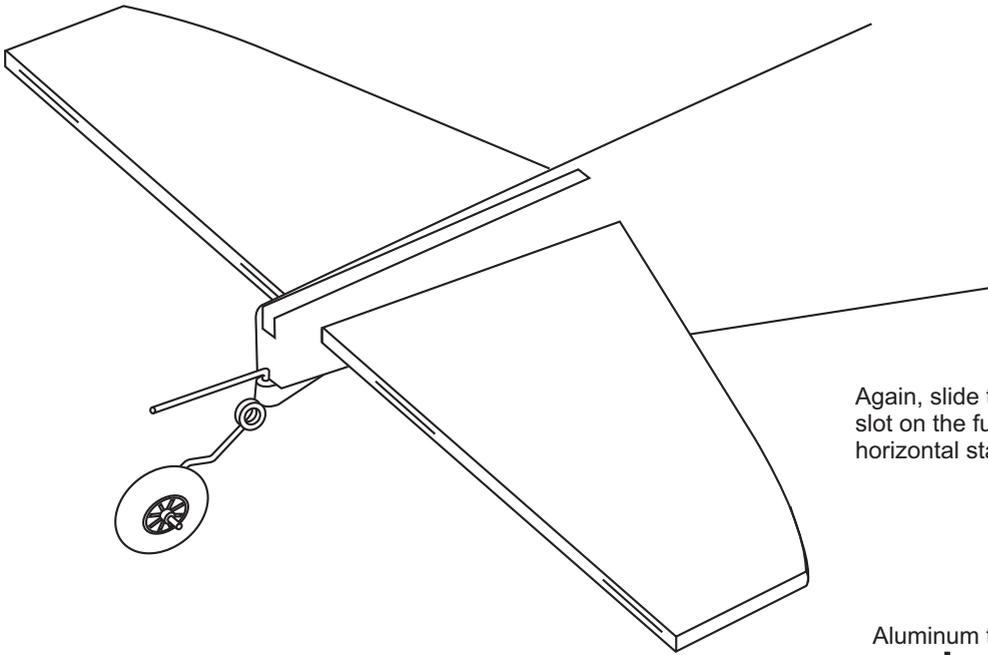
# L-19 BIRD-DOG 10- HORIZONTAL STABILIZER



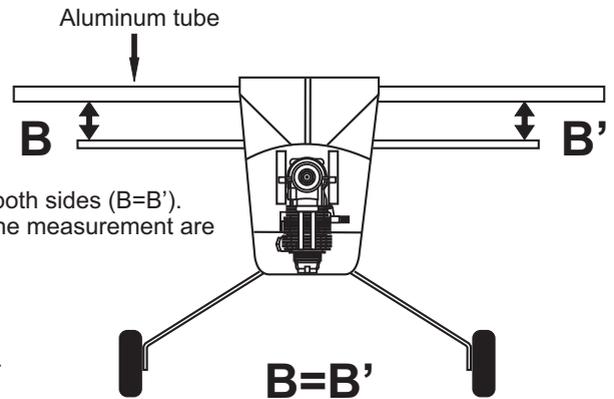
Remove the horizontal stabilizer from the fuselage. Using a straight edge and a sharp hobby knife, carefully cut away the covering **inside the lines** which were marked above. Be cautious **not to cut into the wood**-this will weaken the structure.



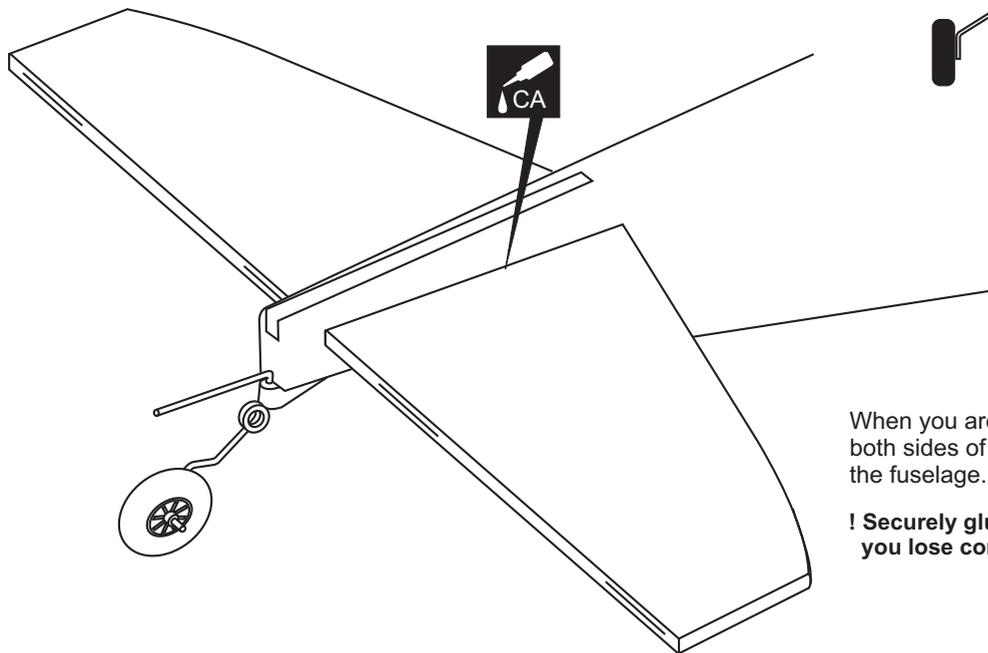
Cut away only the covering both sides.



Again, slide the horizontal stabilizer into the slot on the fuselage. Check the alignment of the horizontal stabilizer.



The distance must be equal on both sides ( $B=B'$ ). If not, adjust the stabilizer until the measurements are the same.

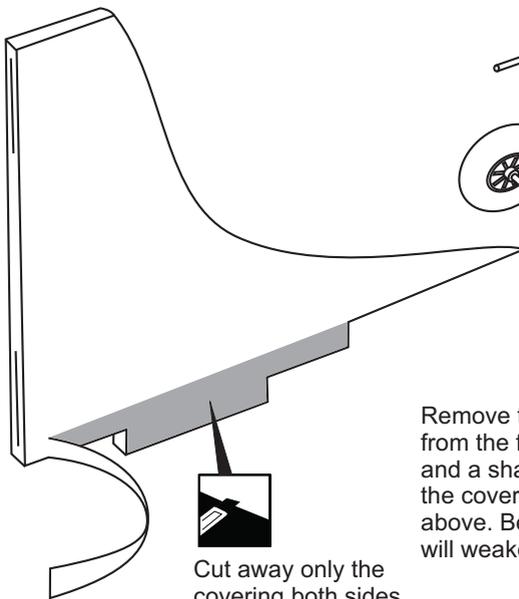
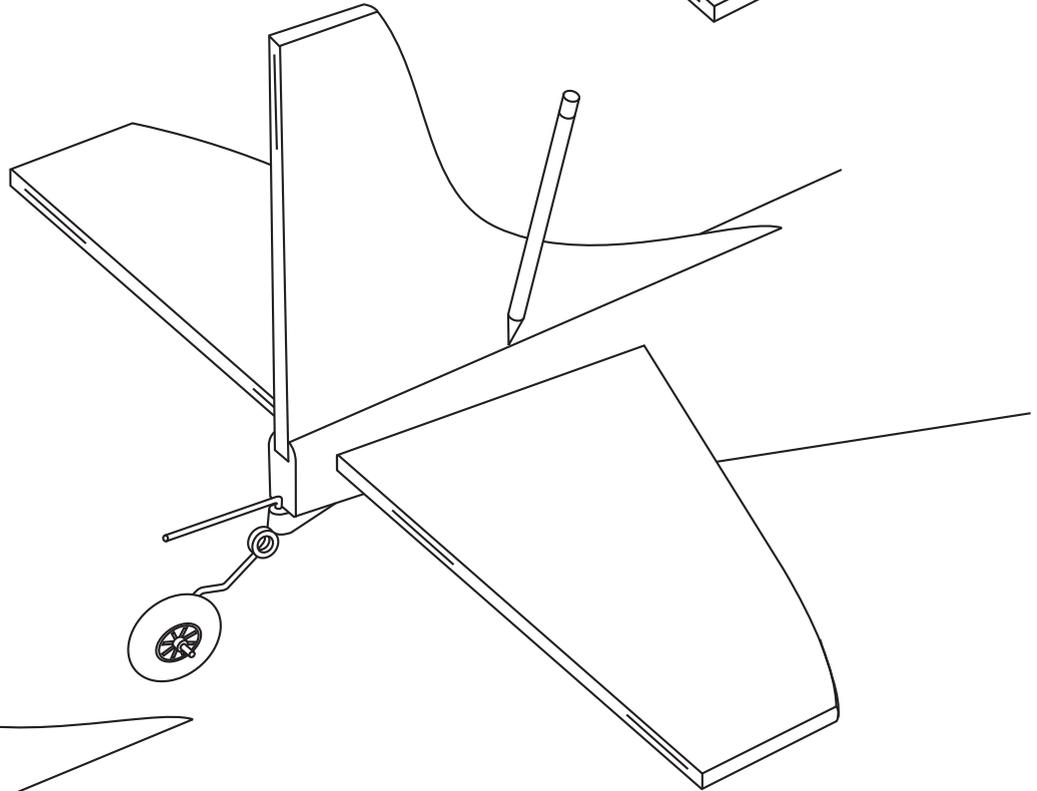
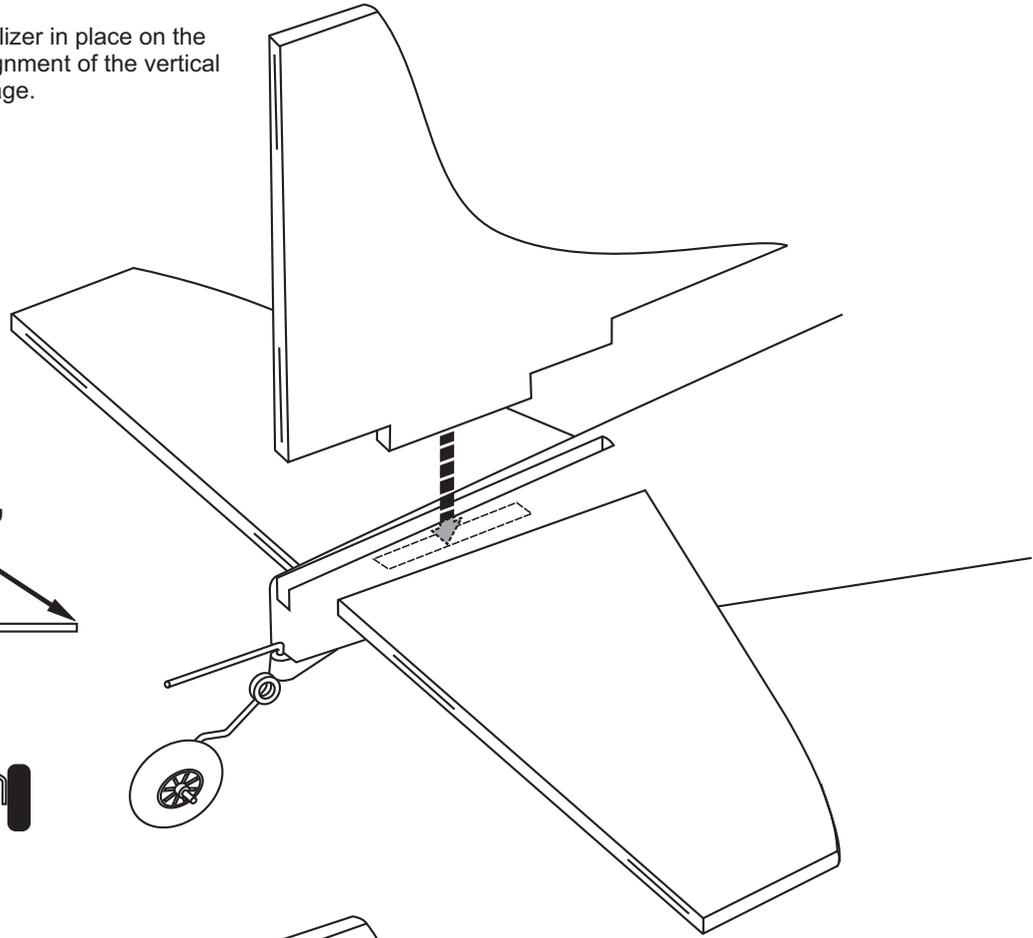
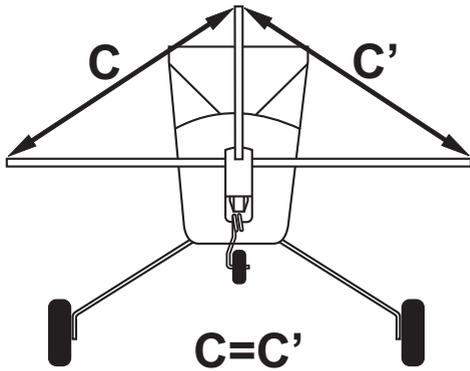


When you are satisfied with the alignment, glue the both sides of the horizontal stabilizer where it meets the fuselage.

**! Securely glue together. If coming off during fly, you lose control of your air plane.**

# L-19 BIRD-DOG 12- VERTICAL STABILIZER

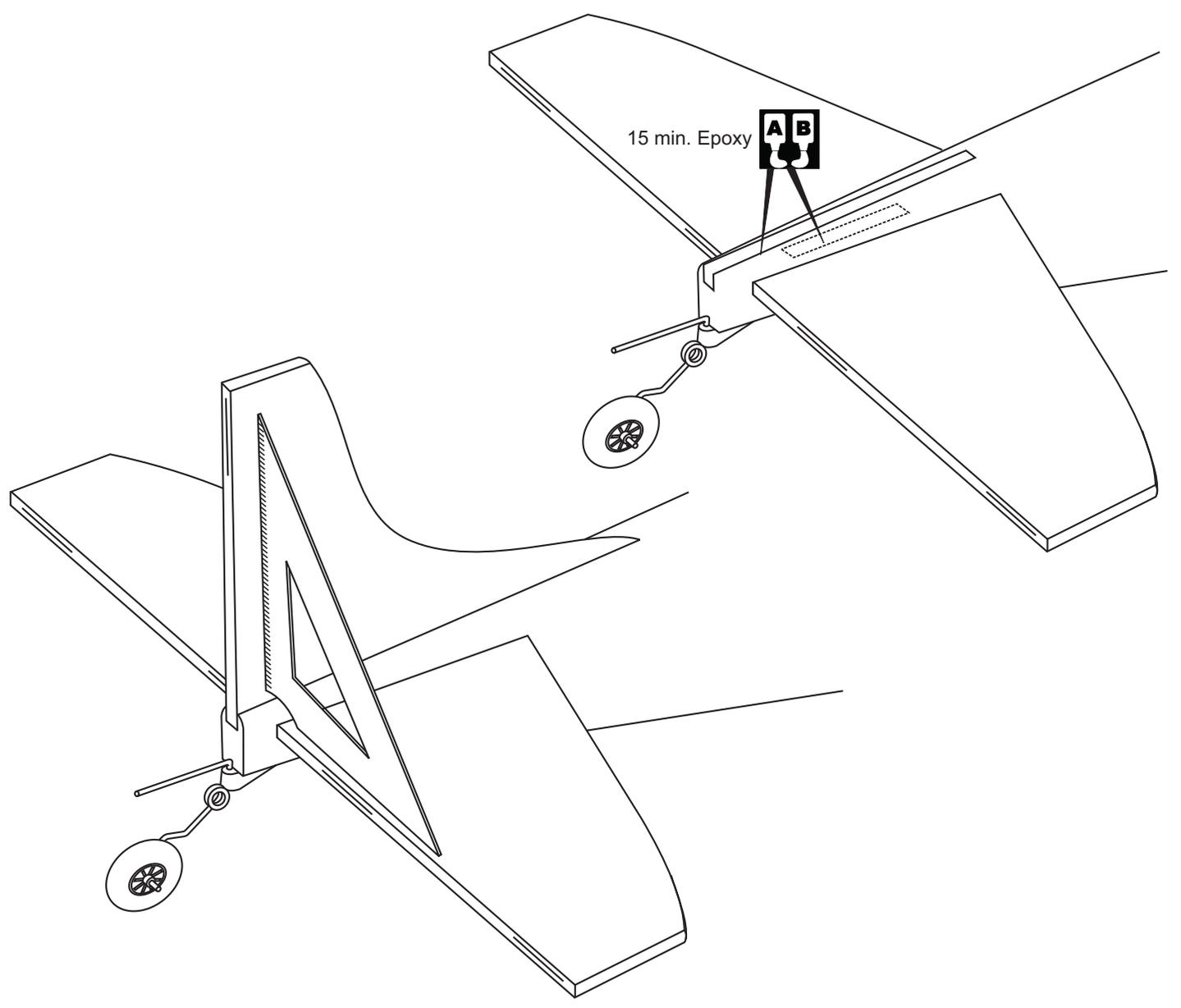
Trial fit the vertical stabilizer in place on the fuselage. Check the alignment of the vertical stabilizer with the fuselage.



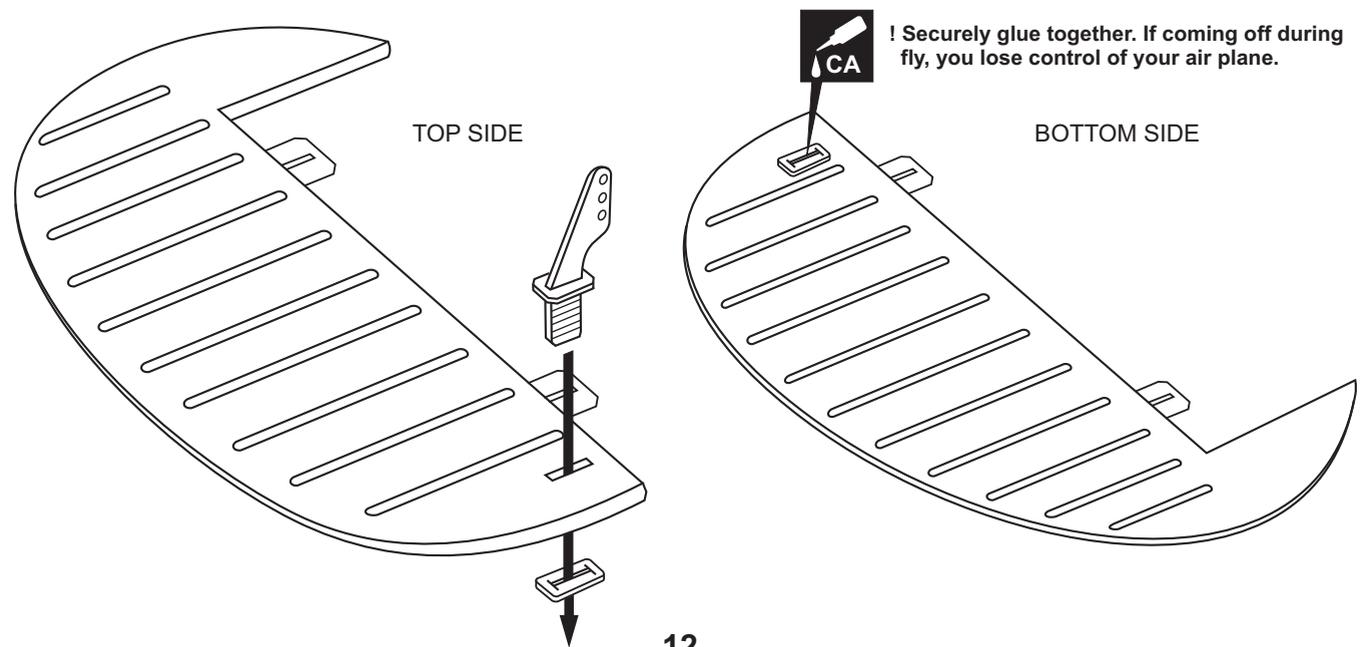
Cut away only the covering both sides.

Remove the vertical stabilizer from the fuselage. Using a straight edge and a sharp hobby knife, carefully cut away the covering **inside the lines** which were marked above. Be cautious **not to cut into the wood**-this will weaken the structure.

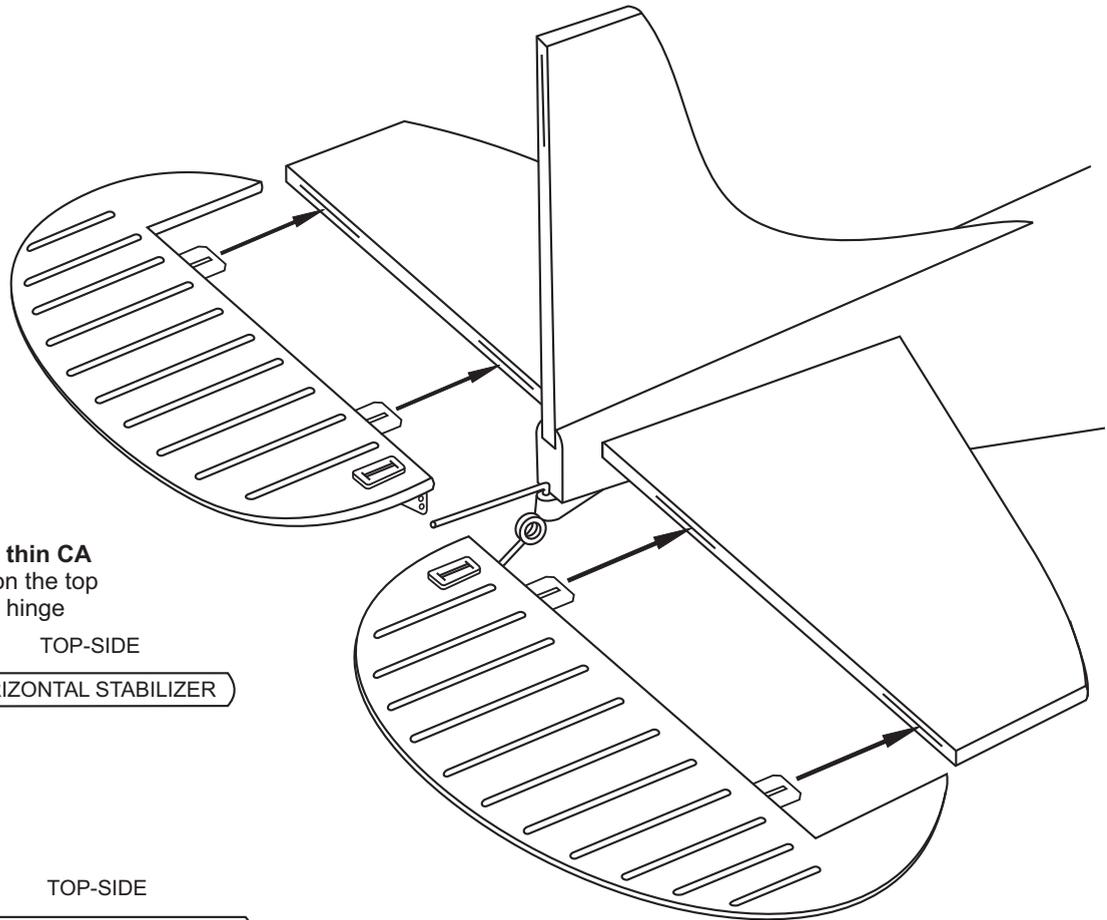
# L-19 BIRD-DOG 13- VERTICAL STABILIZER



# L-19 BIRD-DOG 14- ELEVATOR



# L-19 BIRD-DOG 15- ELEVATOR

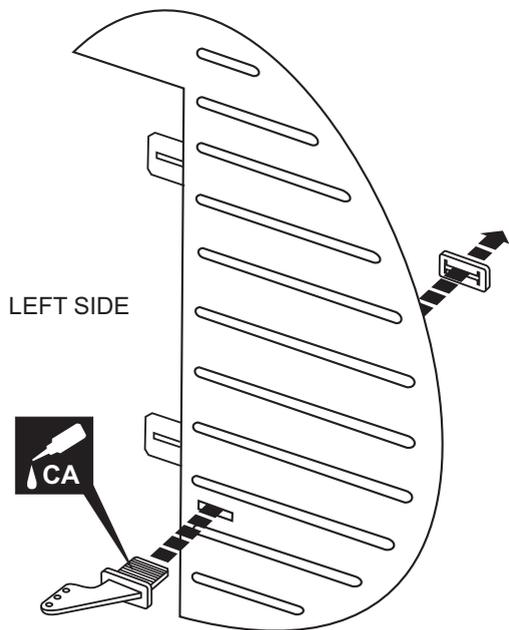


Apply thin CA glue on the top of the hinge  
TOP-SIDE  
HORIZONTAL STABILIZER

TOP-SIDE  
HORIZONTAL STABILIZER  
Apply thin CA glue on the bottom of the hinge

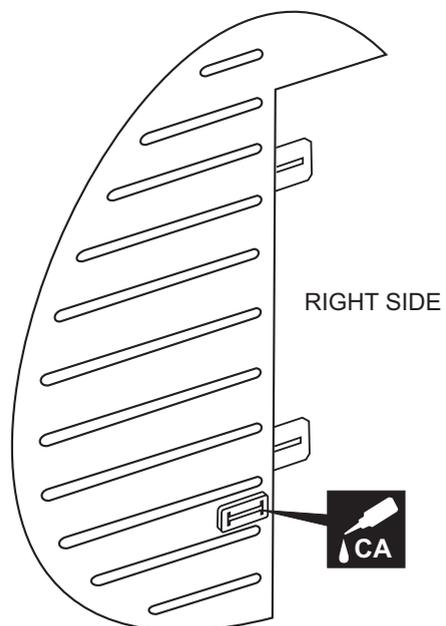
**! Securely glue together. If coming off during fly, you lose control of your air plane.**

# L-19 BIRD-DOG 16- RUDDER



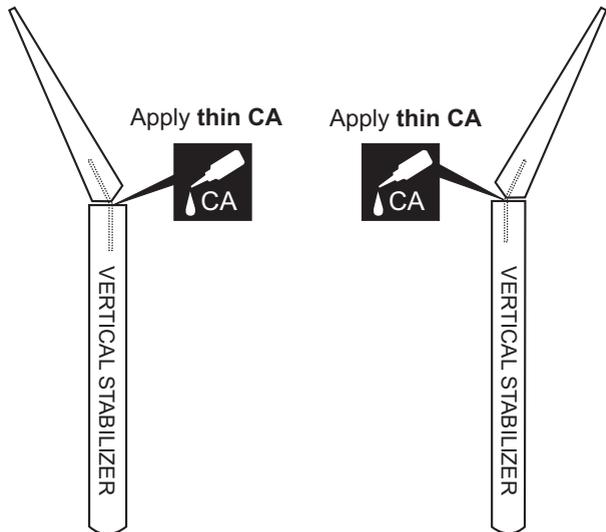
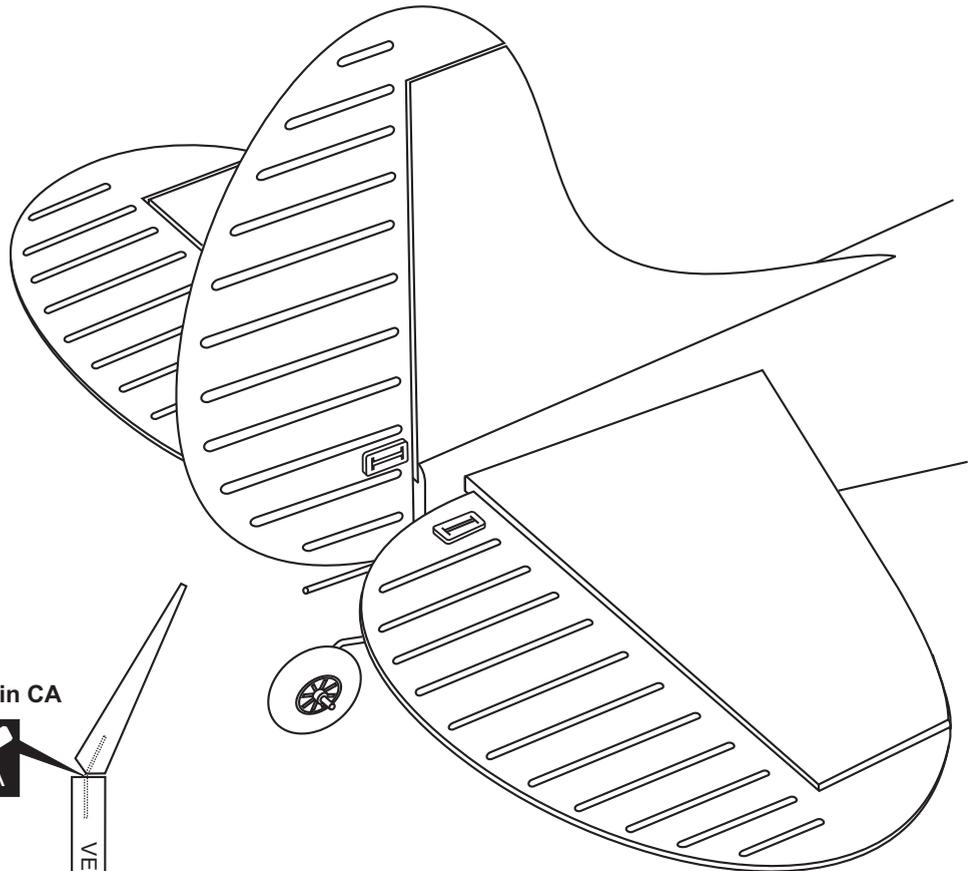
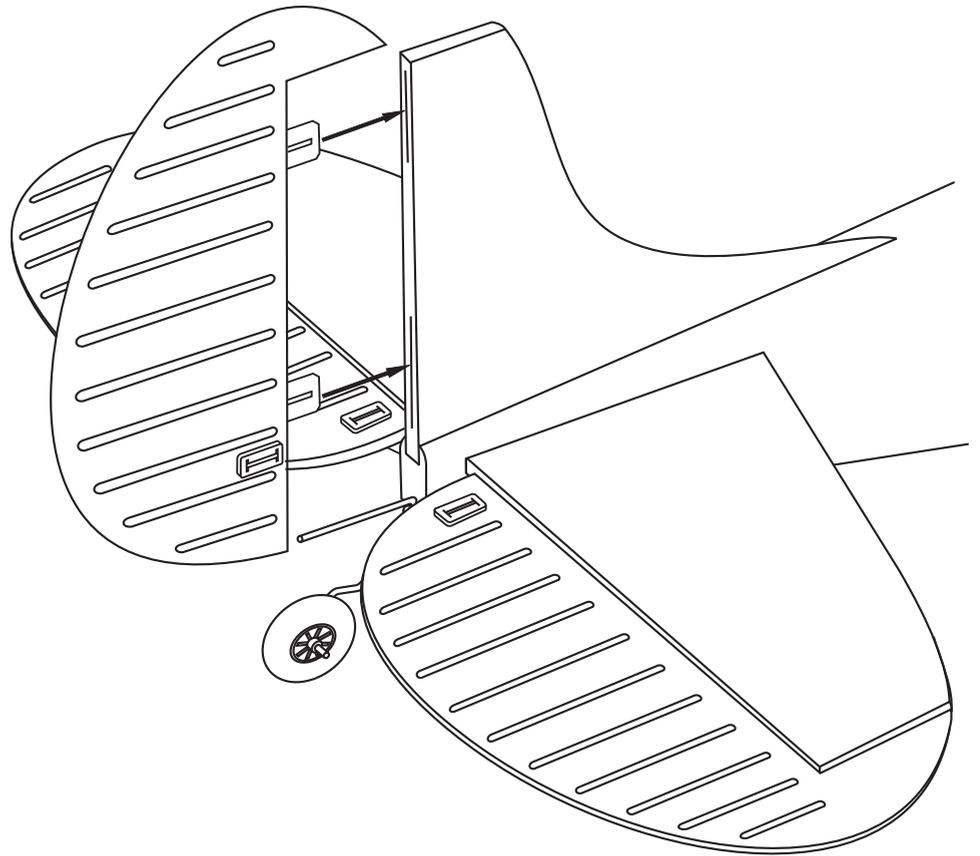
LEFT SIDE

CA



RIGHT SIDE

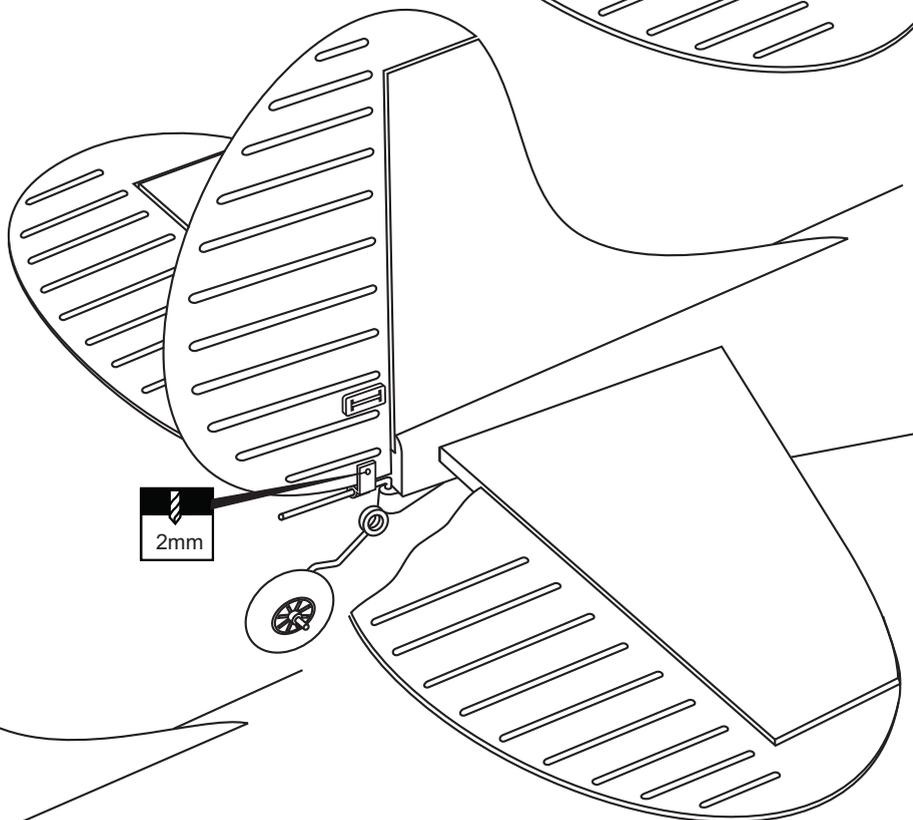
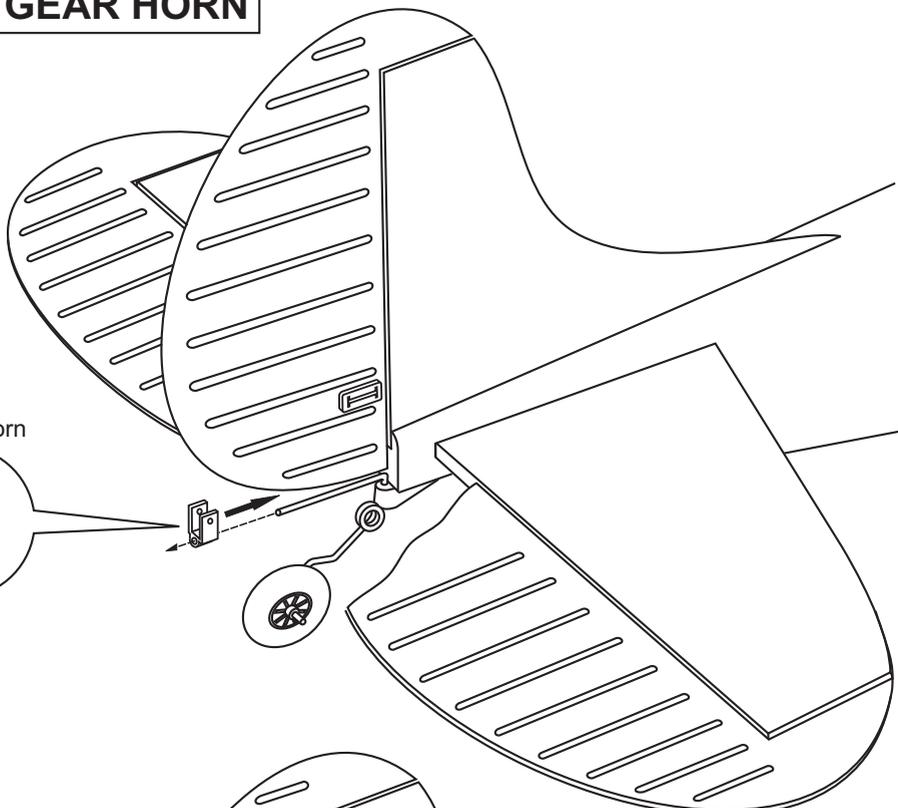
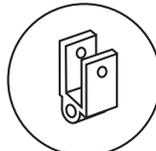
CA



**! Securely glue together. If coming off during fly, you lose control of your air plane.**

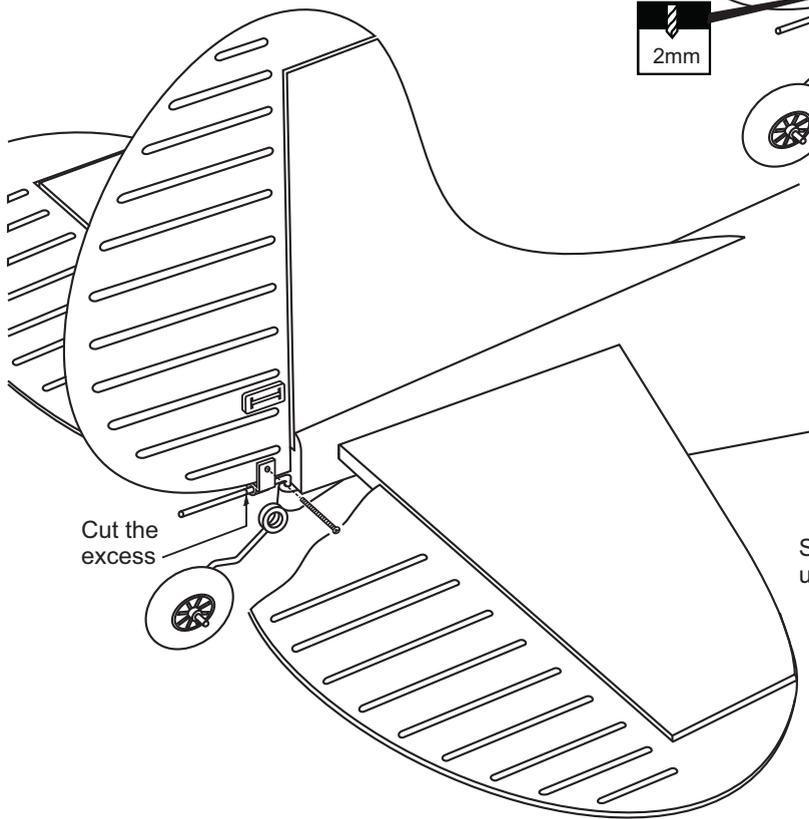
# L-19 BIRD-DOG 18- TAIL GEAR HORN

Tail gear horn



2mm

Cut the excess

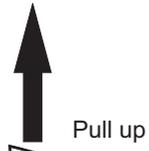
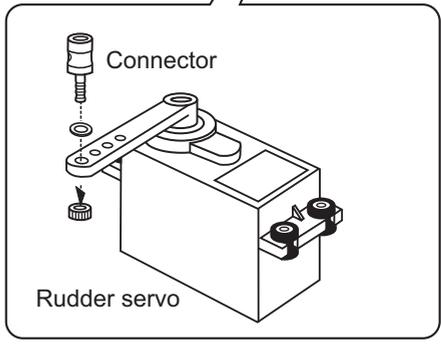
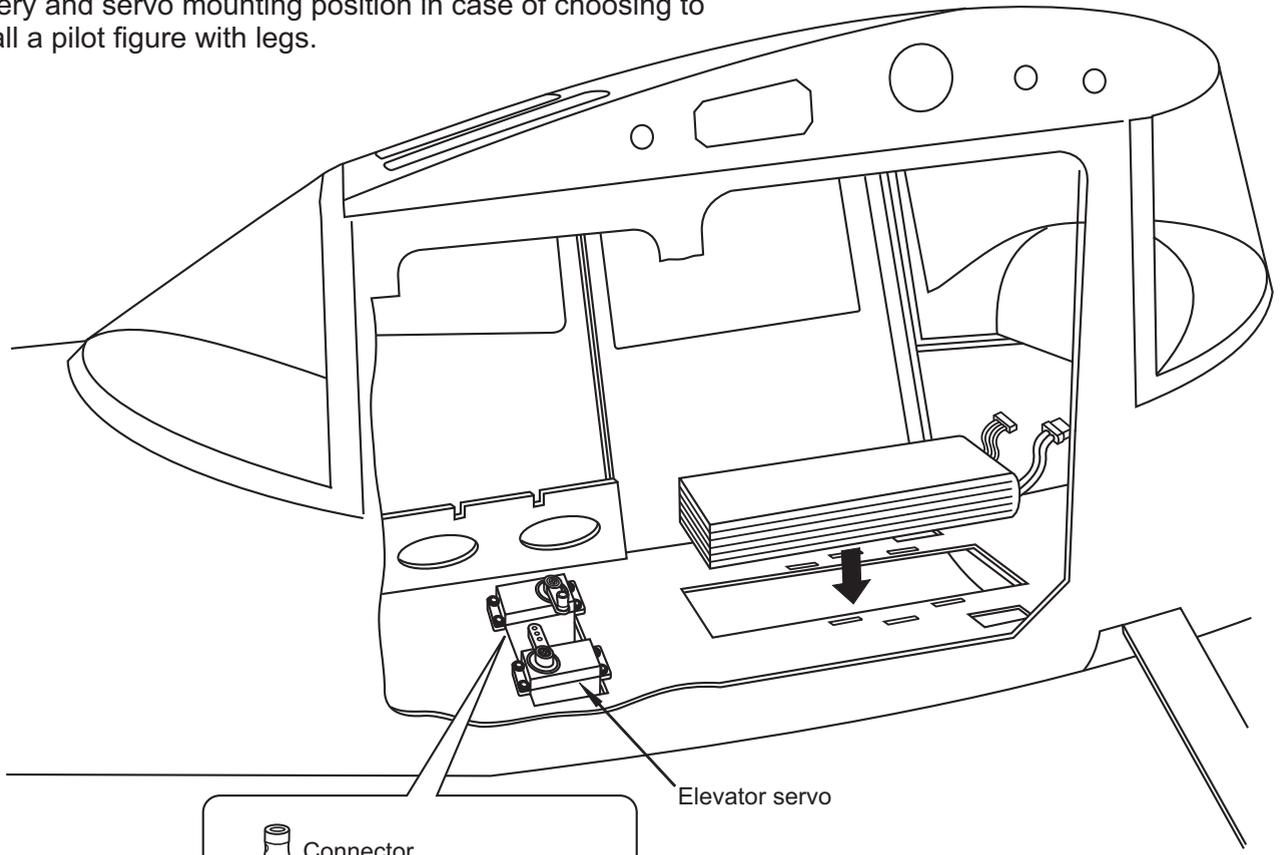


Secure the tail gear control horn in place using 2x10mm screw and nut.

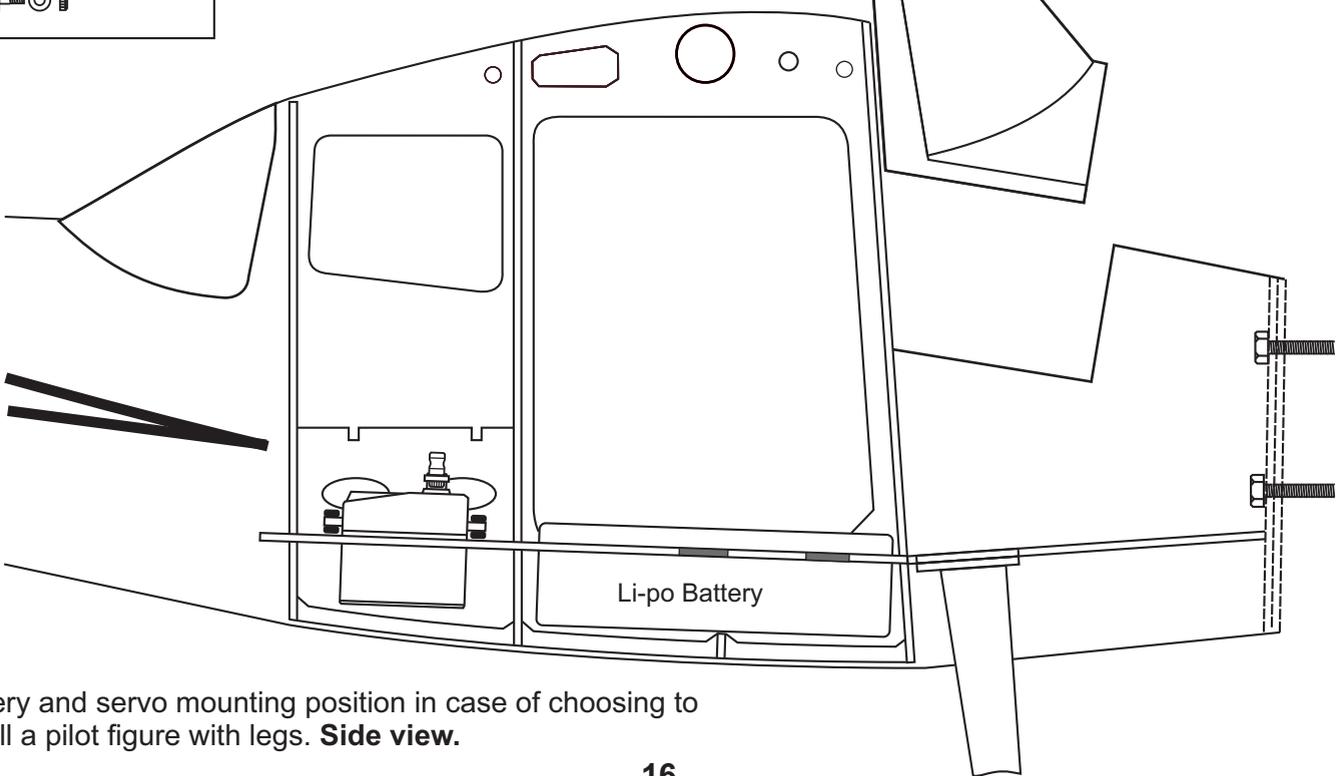
2x10mm screw	.....	1
2mm nut	.....	1
Tail gear control horn	.....	1

# L-19 BIRD-DOG 19- SERVO AND BATTERY

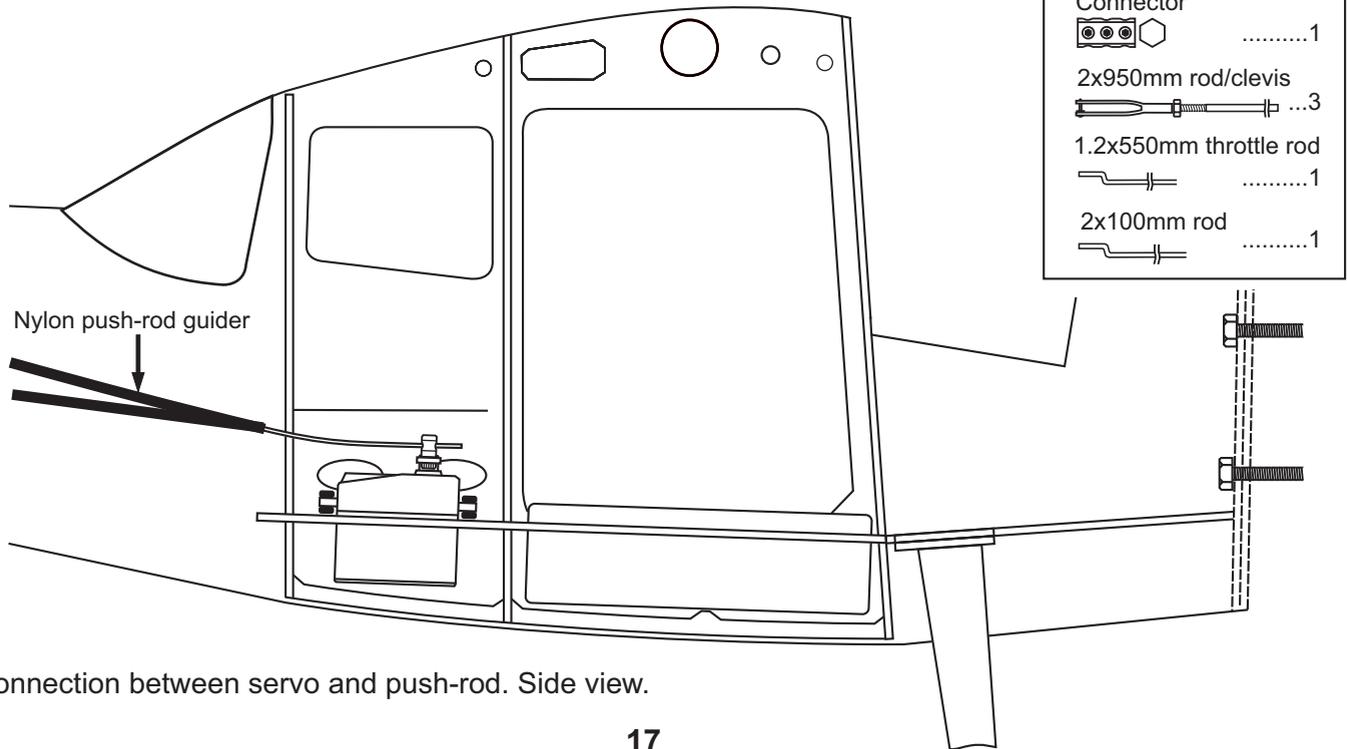
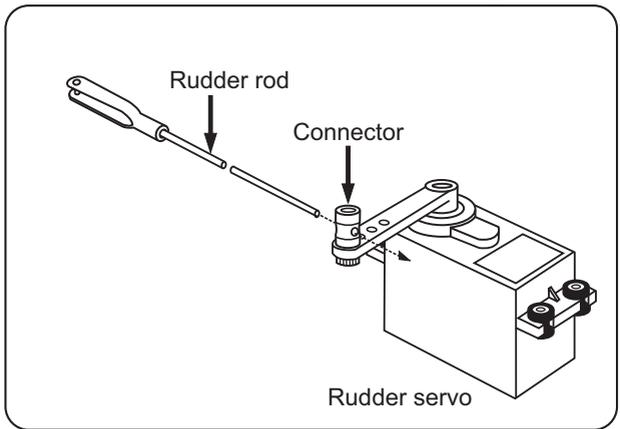
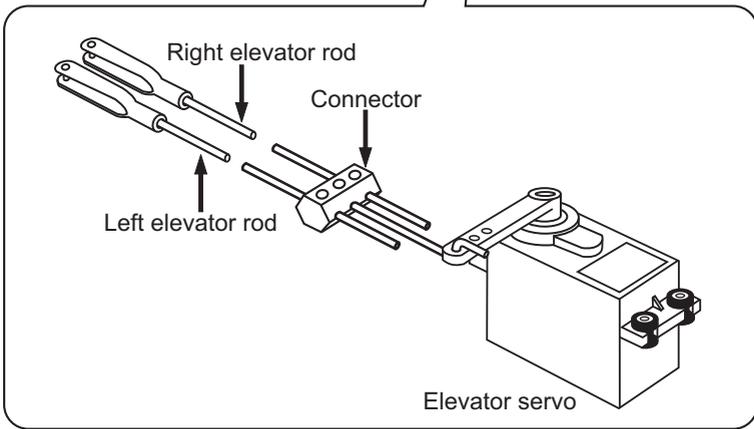
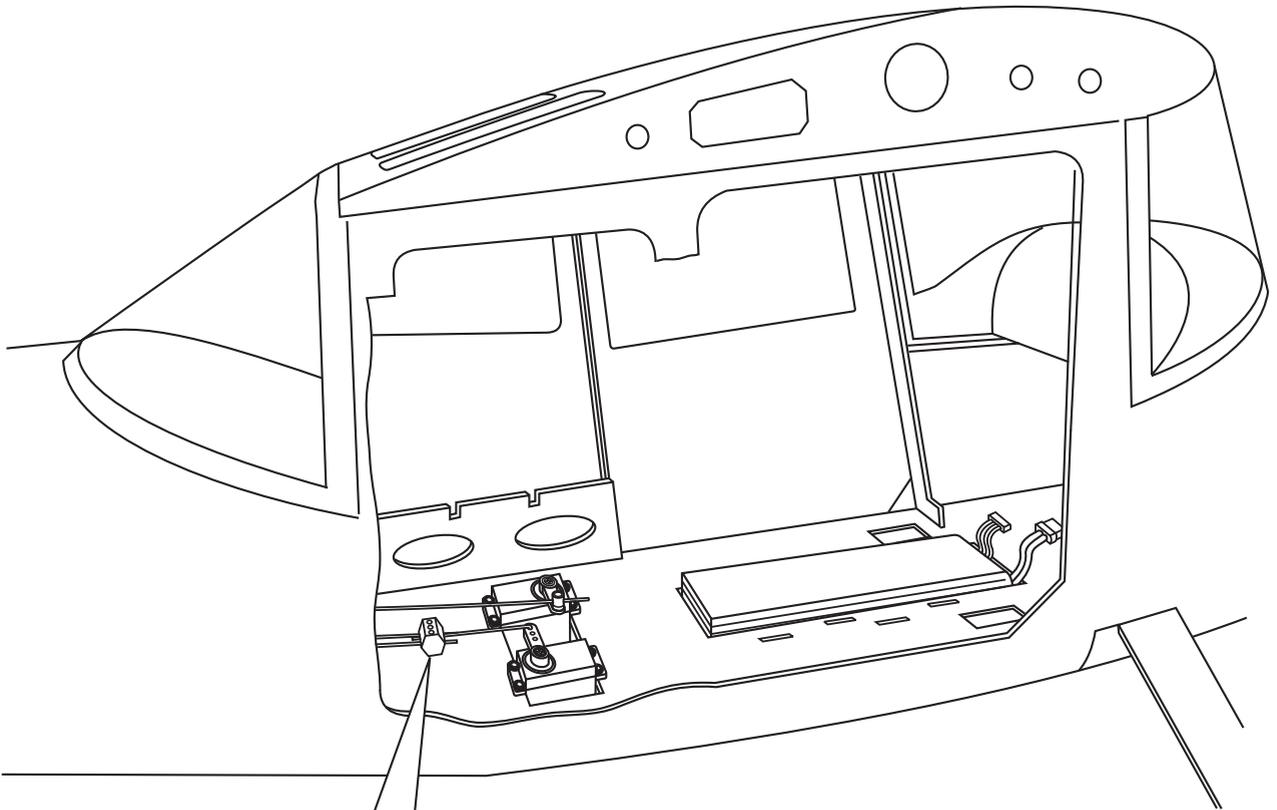
Battery and servo mounting position in case of choosing to install a pilot figure with legs.



- Connector  
 .....1



Battery and servo mounting position in case of choosing to install a pilot figure with legs. **Side view.**



Connection between servo and push-rod. Side view.

## L-19 BIRD-DOG 21- PILOT'S SEAT INSTALLATION

**Note:** The Li-po battery is located under front pilot's seat.

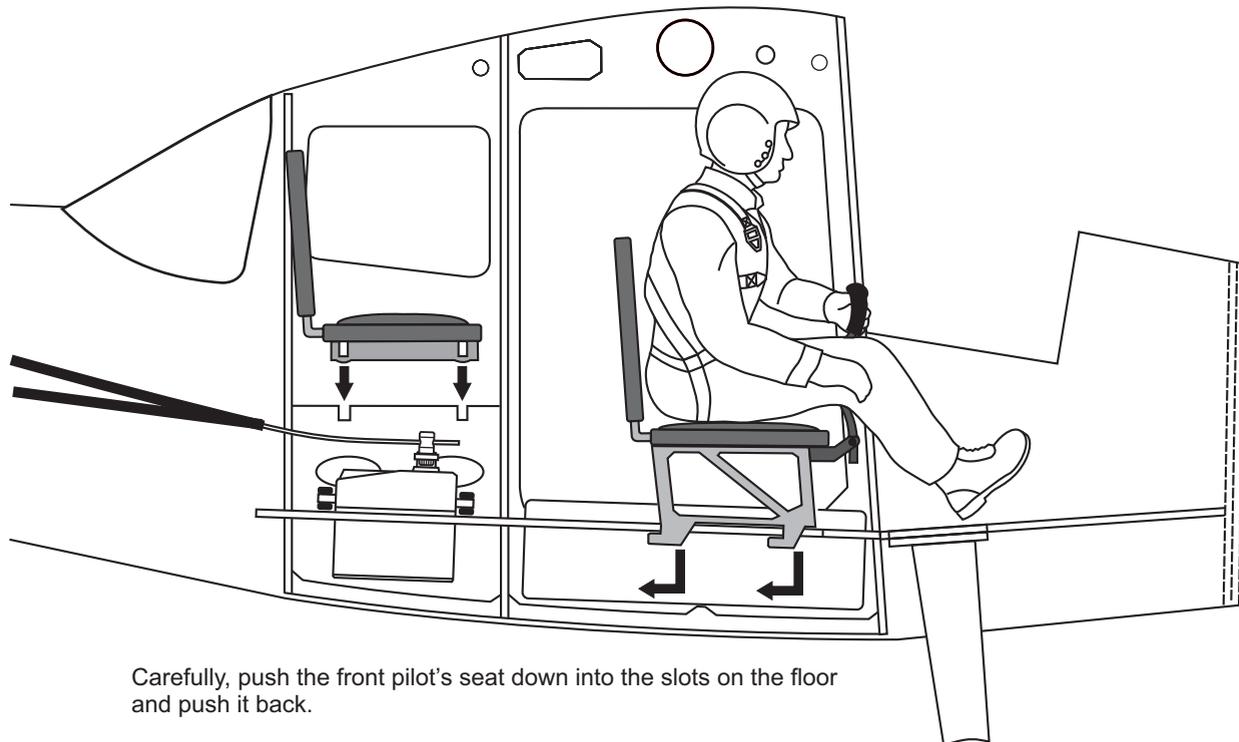


Rear pilot's seat

Glue the pilot to the seat with silicon glue or thick CA glue.



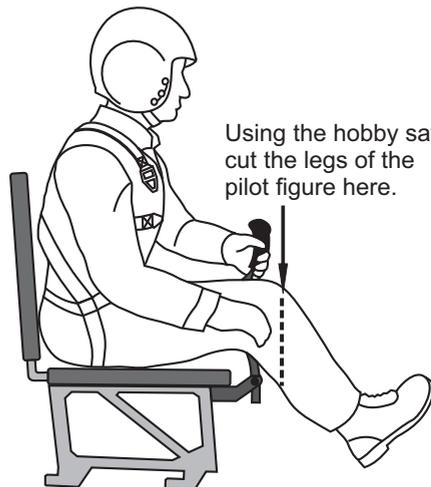
Front pilot's seat



Carefully, push the front pilot's seat down into the slots on the floor and push it back.

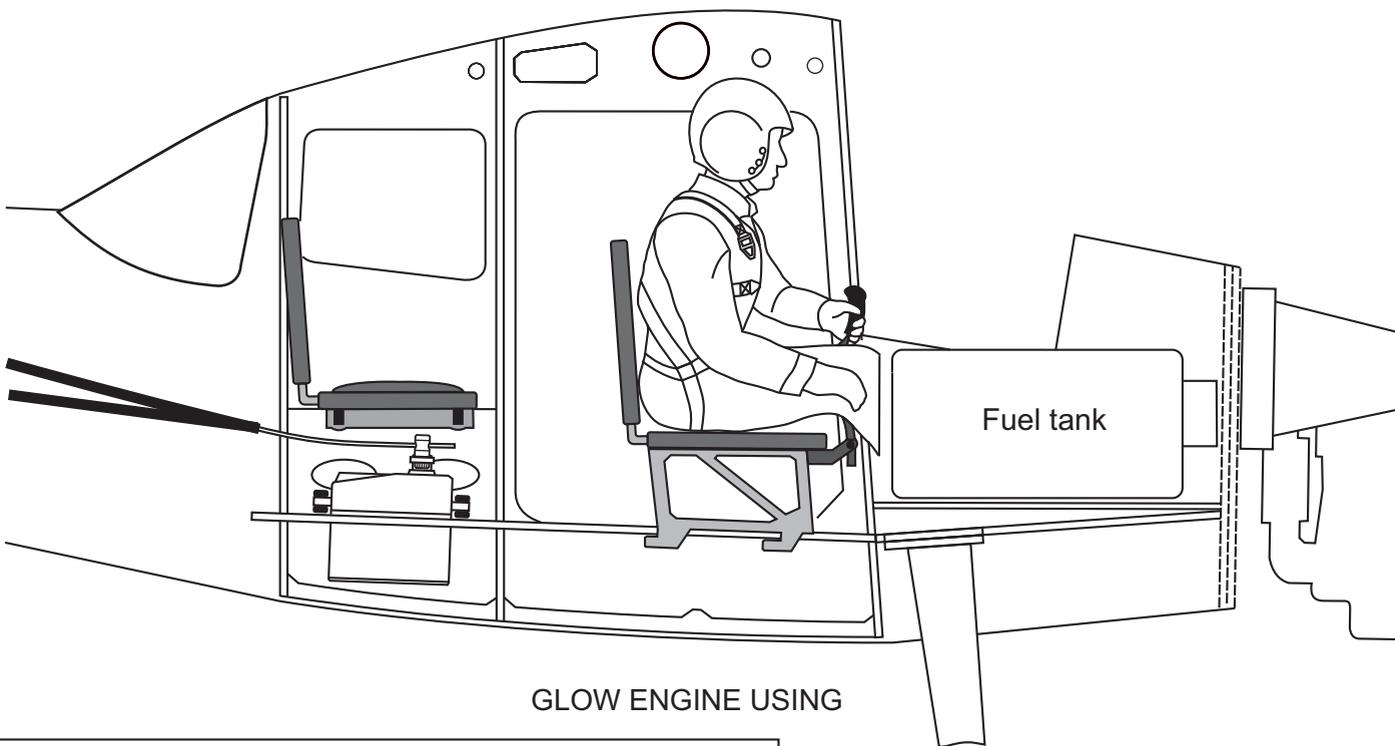
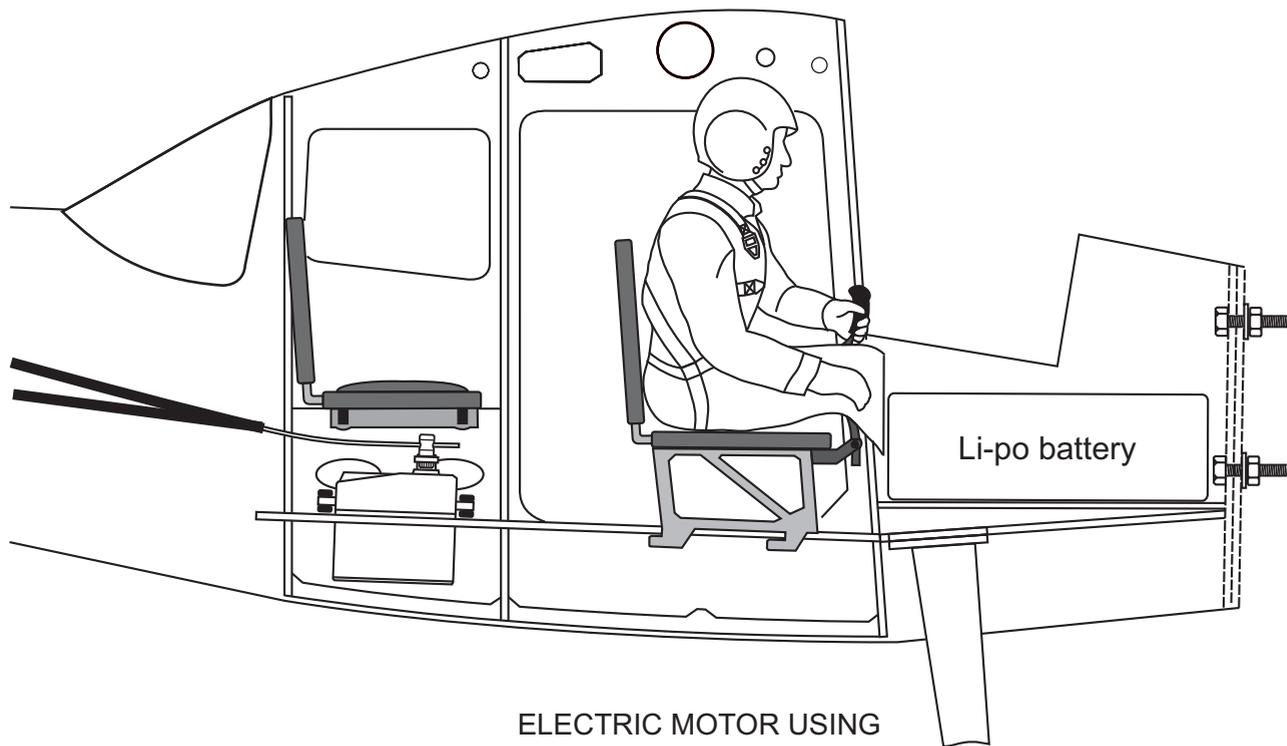
## L-19 BIRD-DOG 22- PILOT'S SEAT INSTALLATION

**Note:** The Li-po battery is located on the back of fire-wall (in case of electric motor using) or the fuel-tank is located on the back of fire-wall (in case of glow engine using).



Using the hobby saw, cut the legs of the pilot figure here.





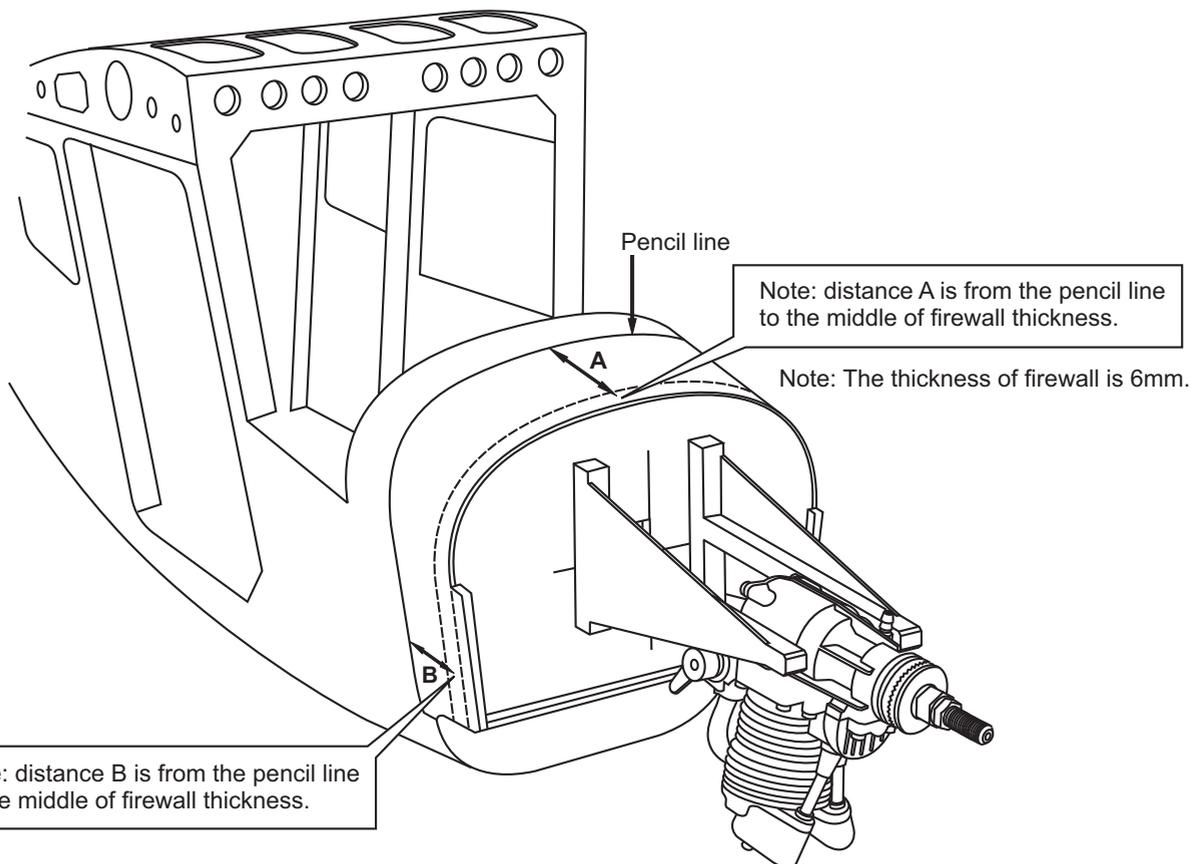
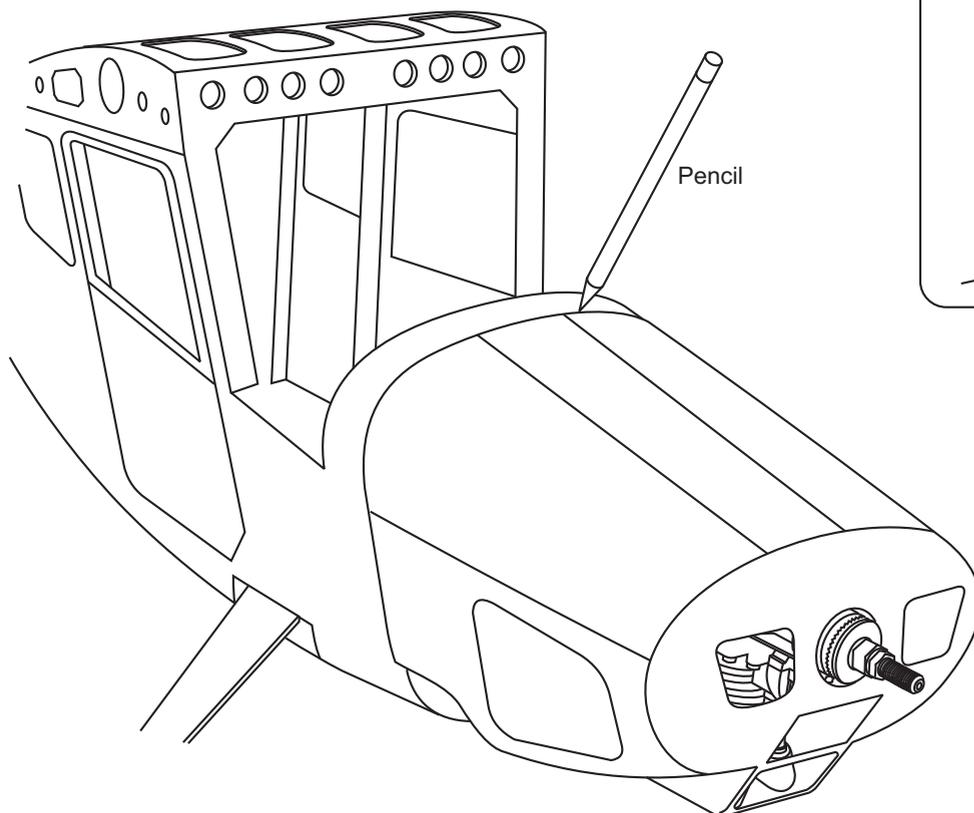
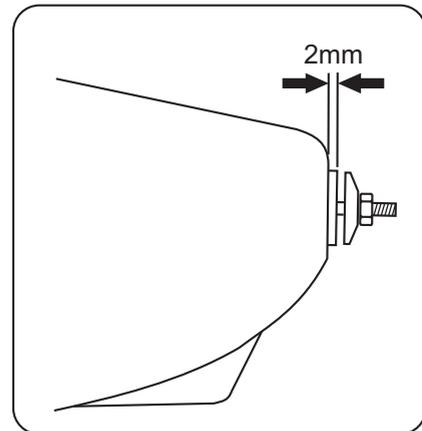
**Before installing the cowl (in case of glow engine using):**

- 1- Drill a 3mm hole on the fire-wall where the pushrod tube exits.
- 2- Slide the pushrod tube into the hole.
- 3- Slide the wire, straight end first, into the pushrod tube.
- 4- Insert the "Z" bend into the hole on the throttle lever of the engine.  
Note: it maybe easier to temporarily remove the throttle lever from the carburetor.

# L-19 BIRD-DOG 24- INSERT THE COWL

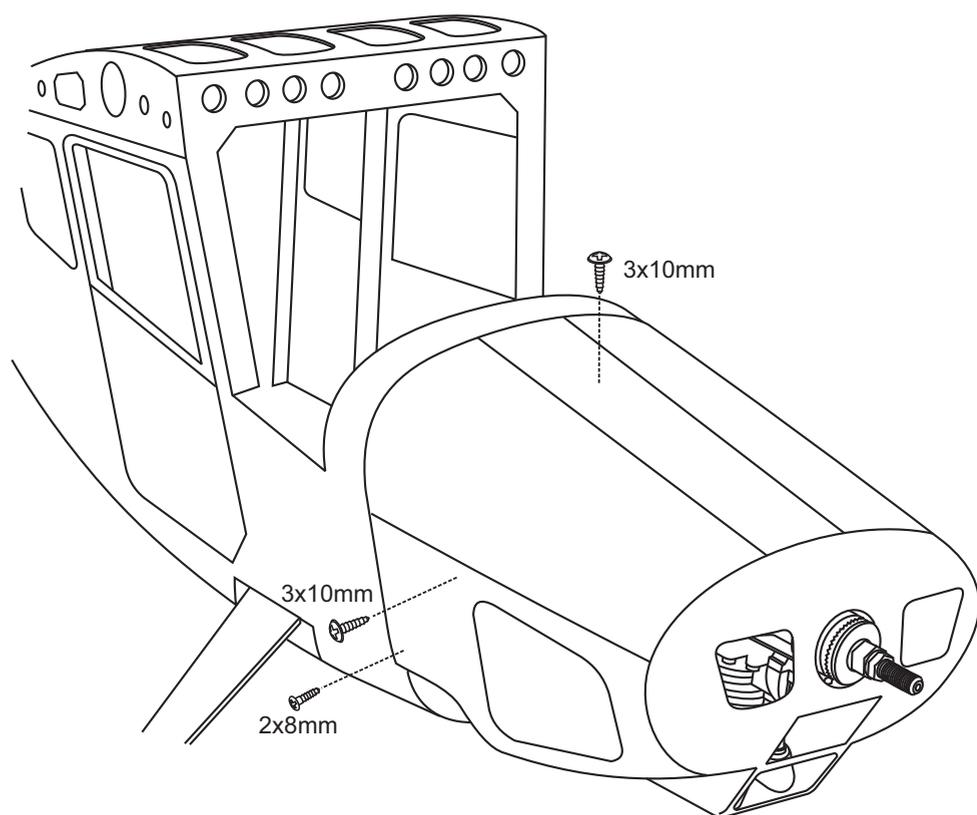
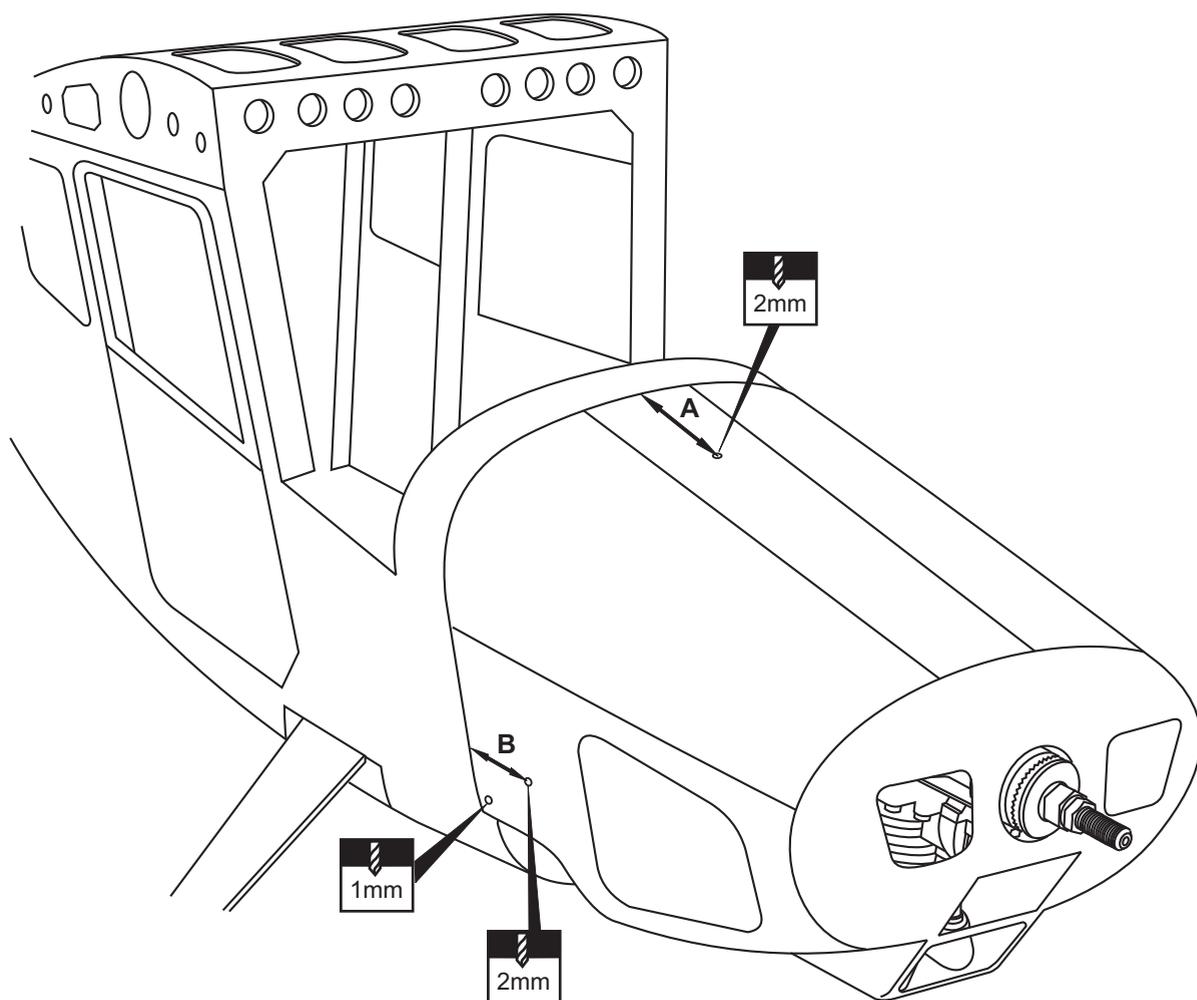
Insert the cowl onto the fuselage so that the distance from the prop hub of engine to the front of the cowl is 2mm as shown.

Using a pencil, trace around the fuselage where the back of the cowl meet the fuselage.



# L-19 BIRD-DOG 25- INSERT THE COWL

Again, insert the cowl on to the fuselage so that the back of the cowl meet the pencil line and drill three 2mm holes and two 1mm holes as shown.



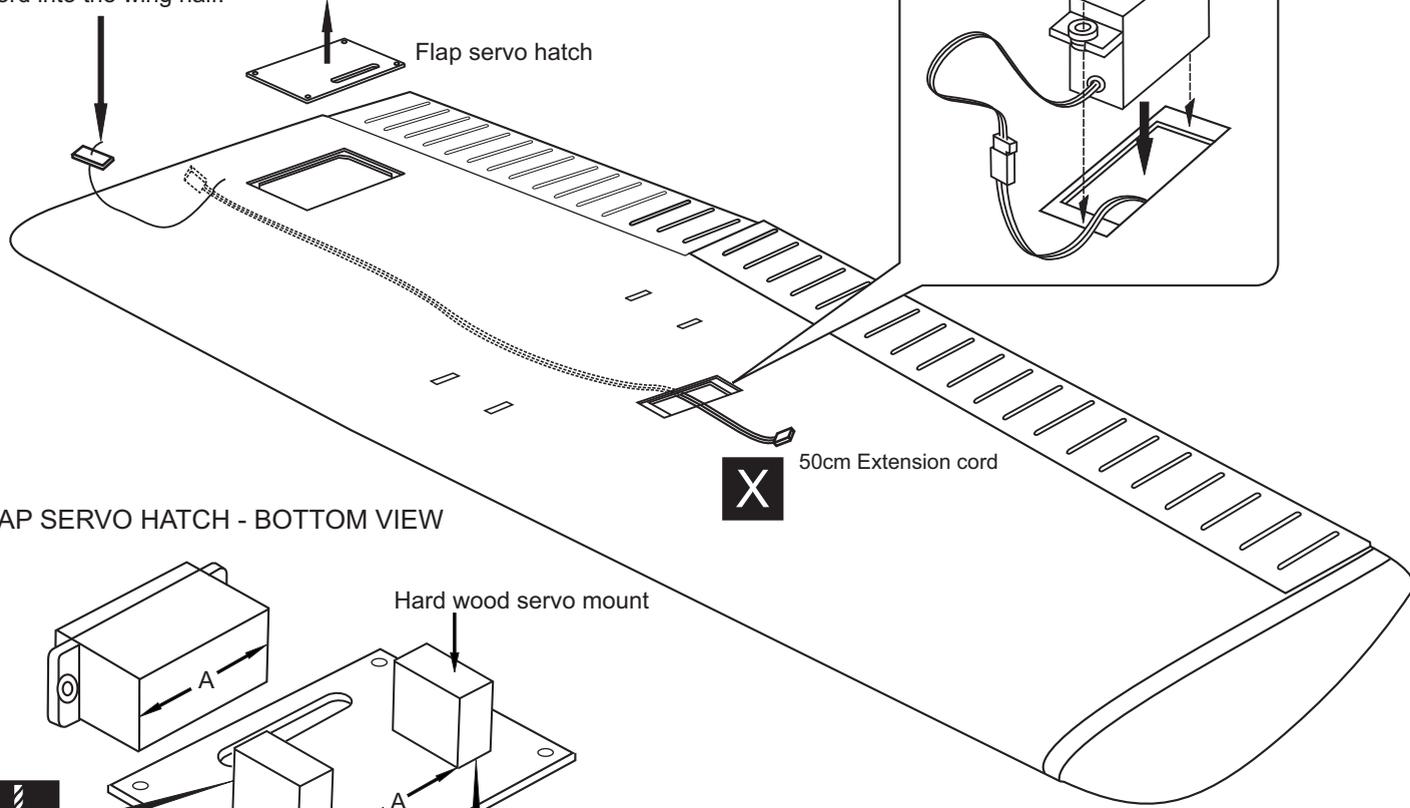
2x8mm screw

 .....2

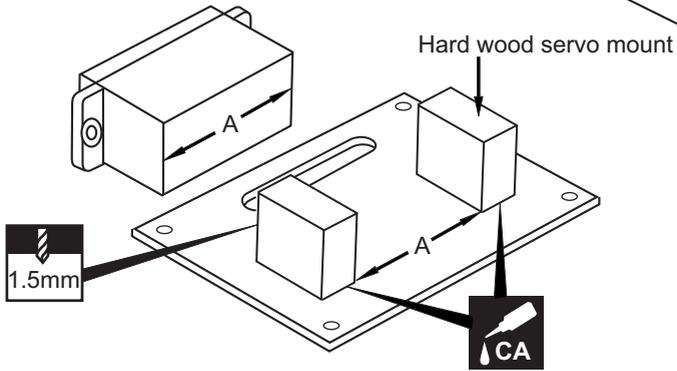
3x10mm screw

 .....3

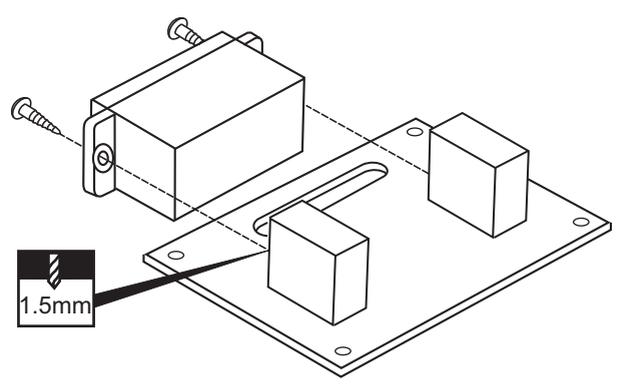
Using the thread (pre-installed at factory) to slide the aileron extension cord into the wing half.



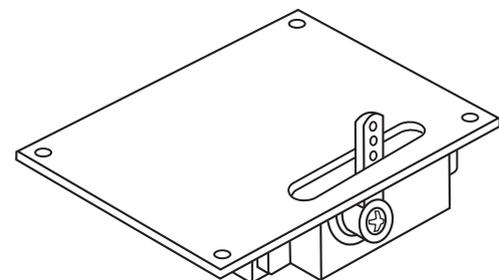
FLAP SERVO HATCH - BOTTOM VIEW



**! Securely glue together. If coming off during fly, you lose control of your air plane.**



FLAP SERVO HATCH - TOP VIEW



**! IMPORTANT:**  
To be safe, you must attach the four screws as shown in this picture.

2x8mm

2x8mm

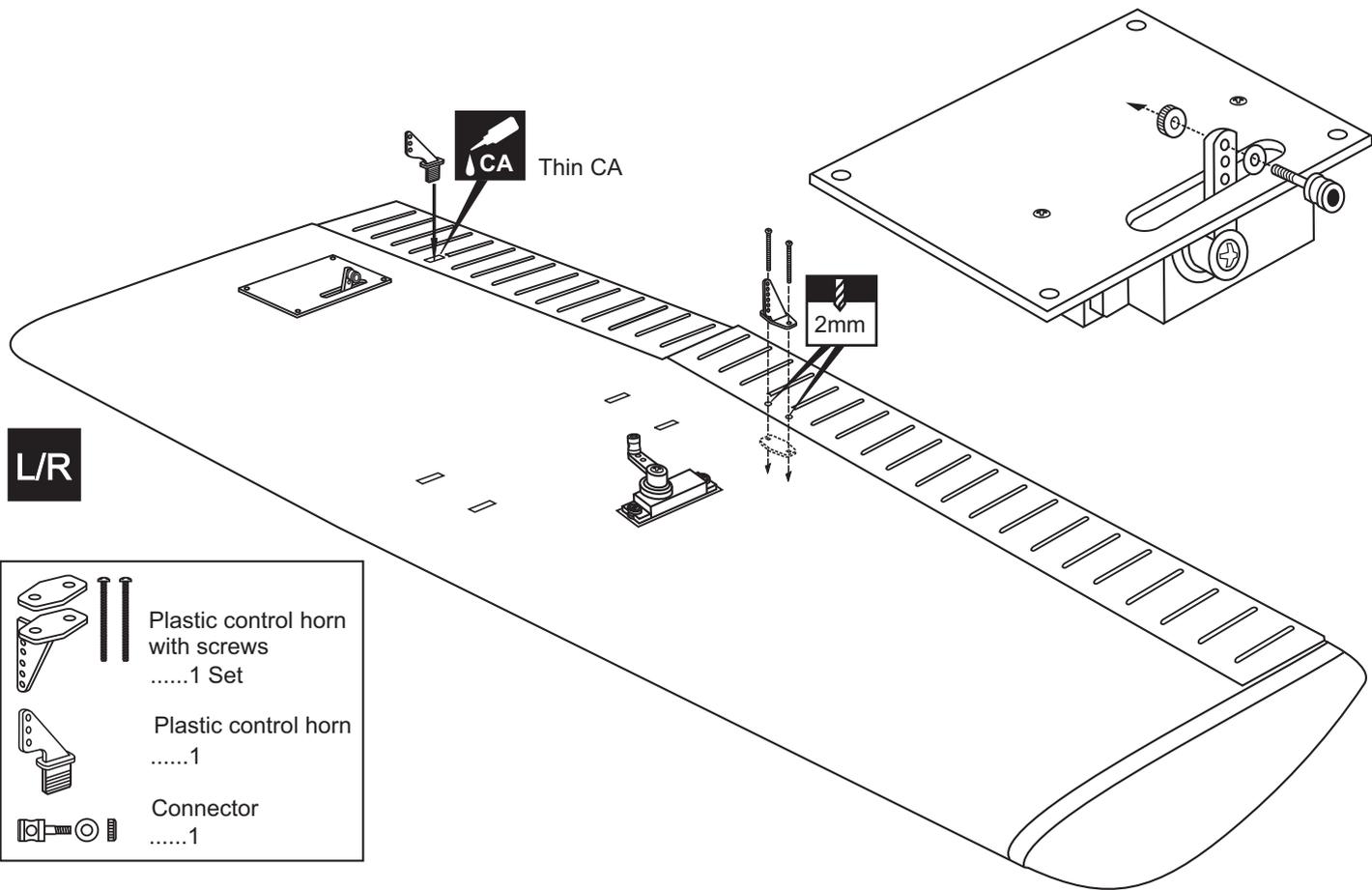
1mm

1mm

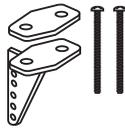
2x8mm screw

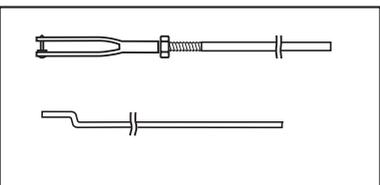
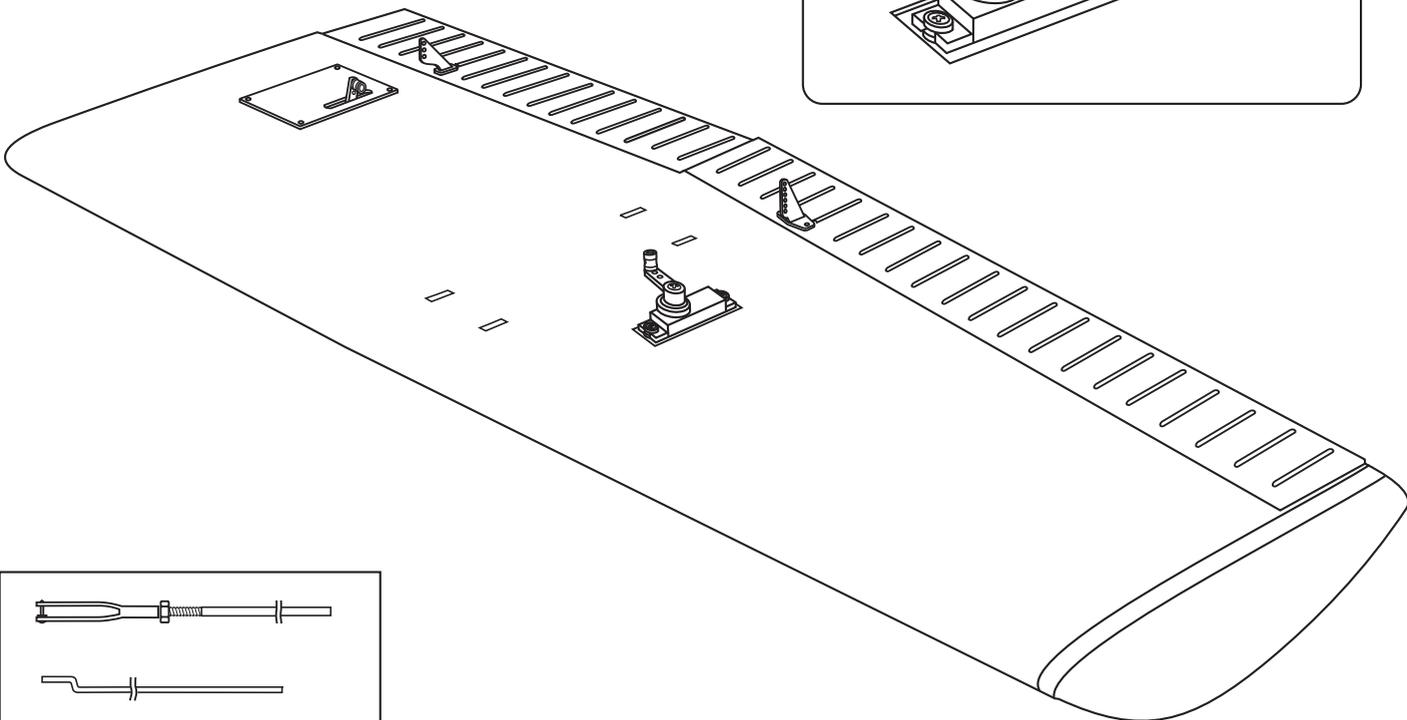
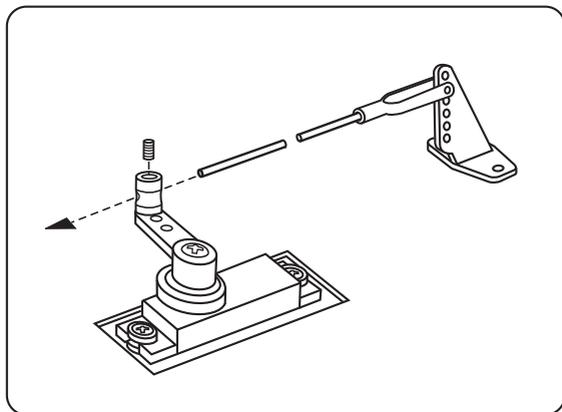
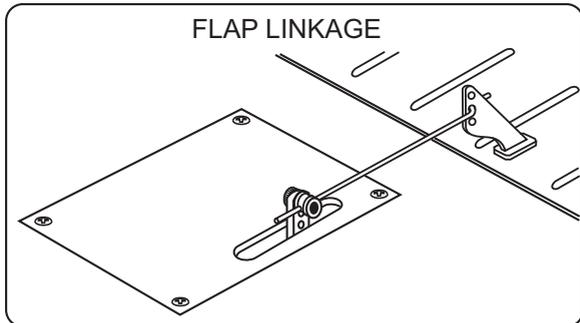
servo hatch

servo mount

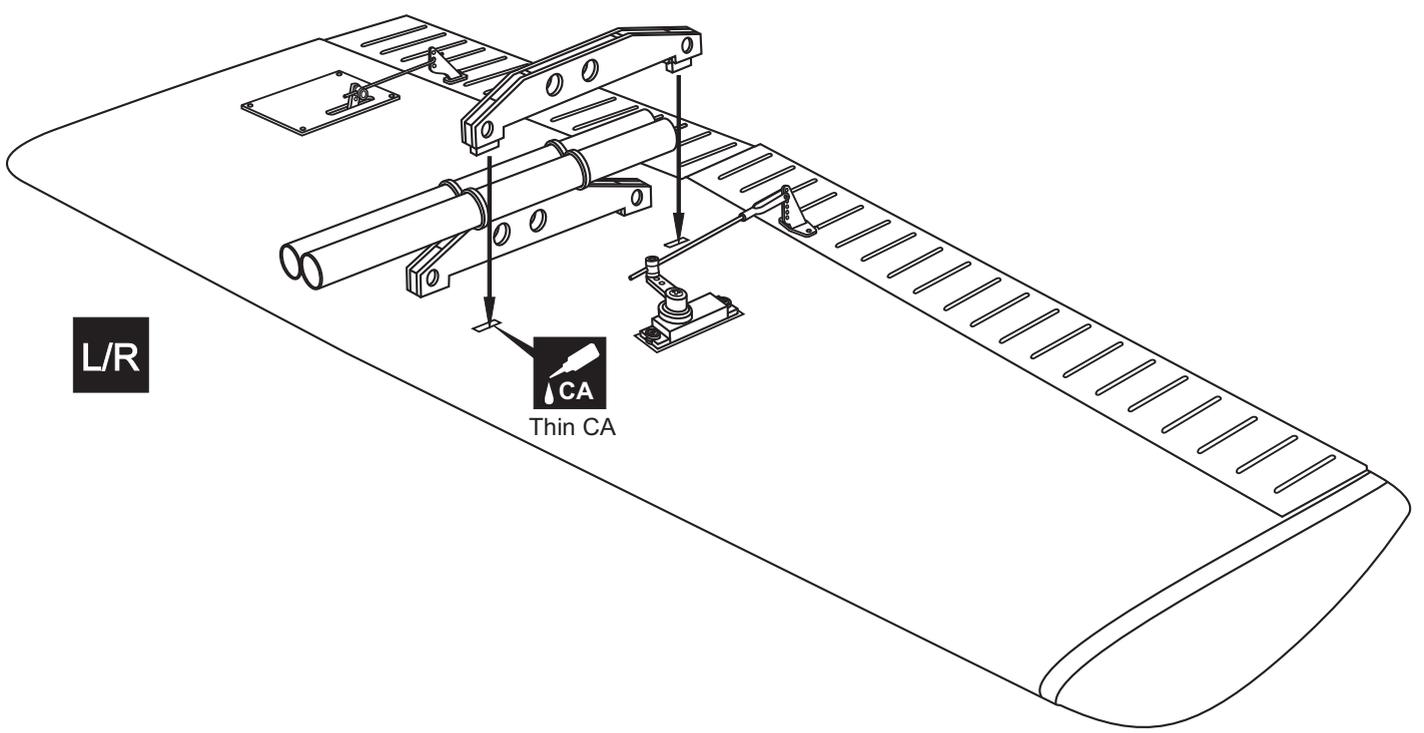
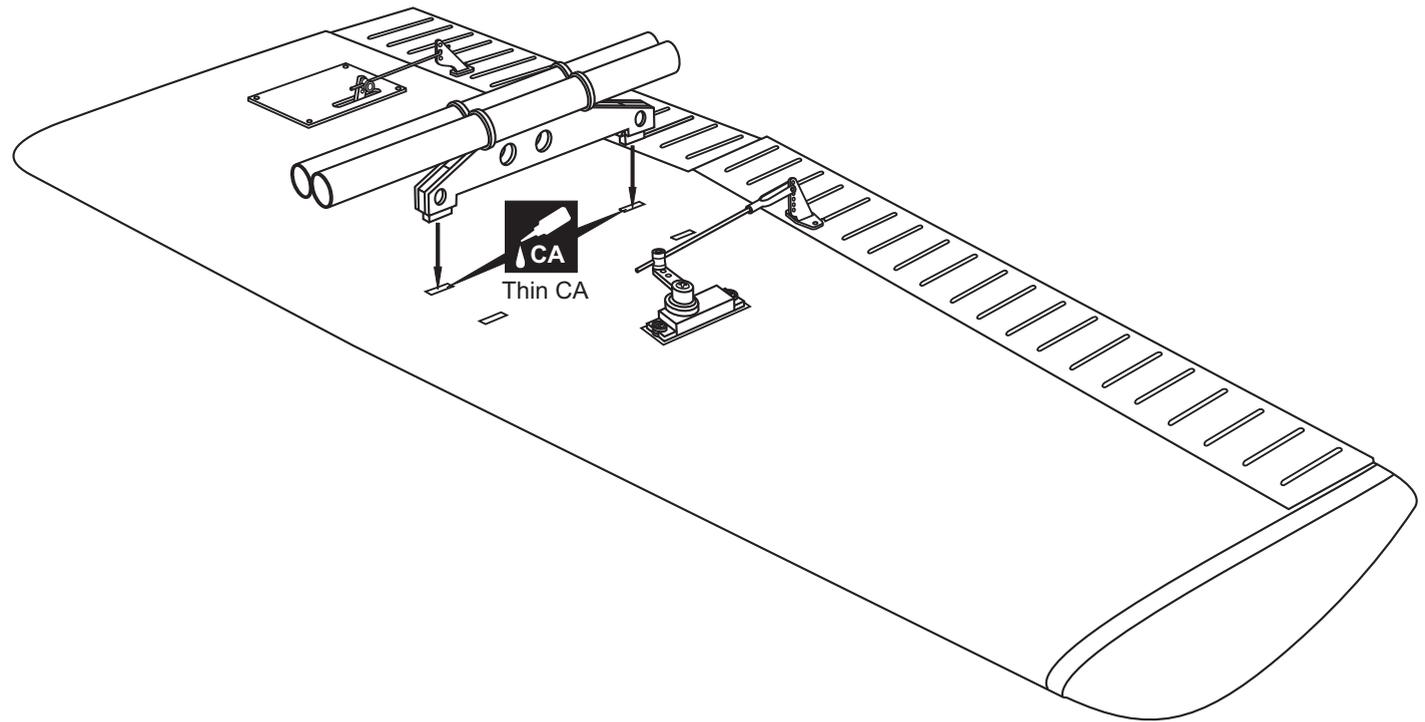
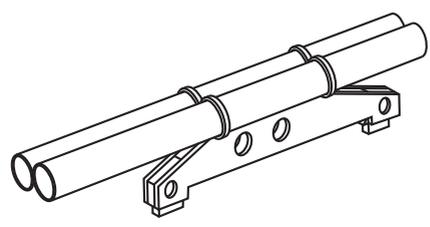
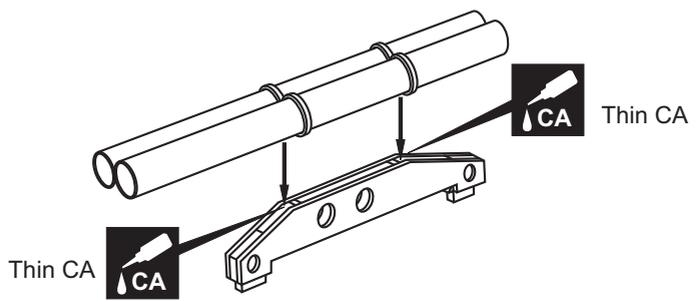


L/R

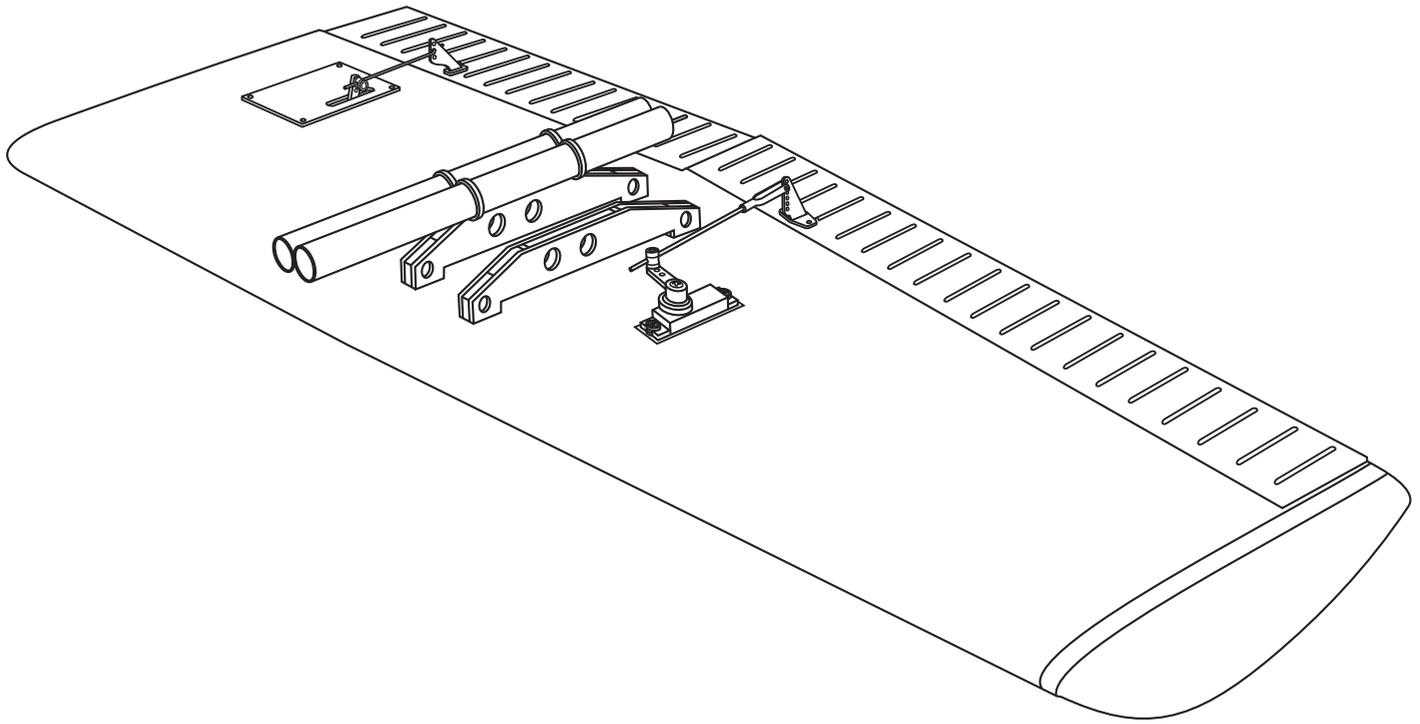
-  Plastic control horn with screws .....1 Set
-  Plastic control horn .....1
-  Connector .....1



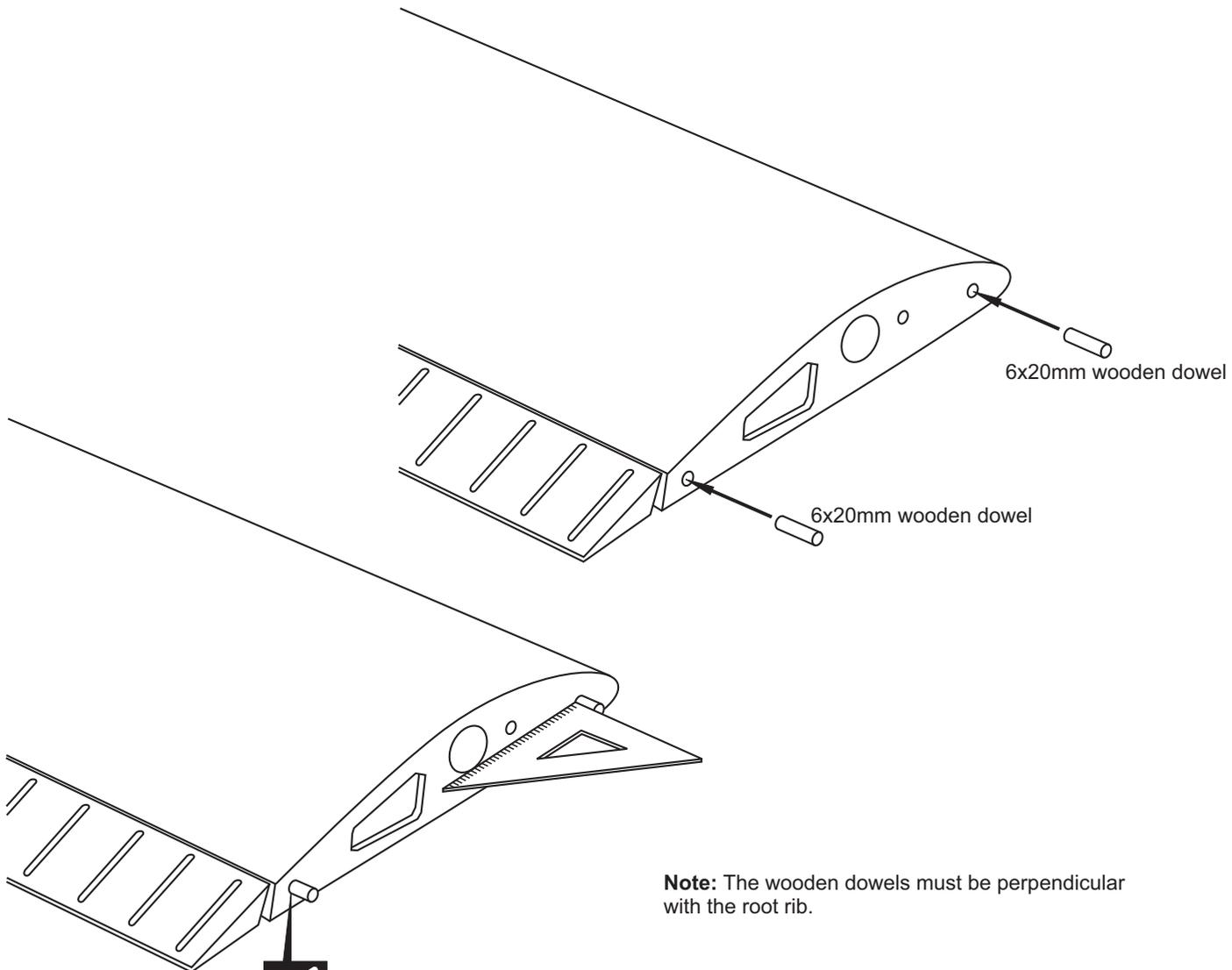
# L-19 BIRD-DOG 28- WING: ROCKET LAUNCHER



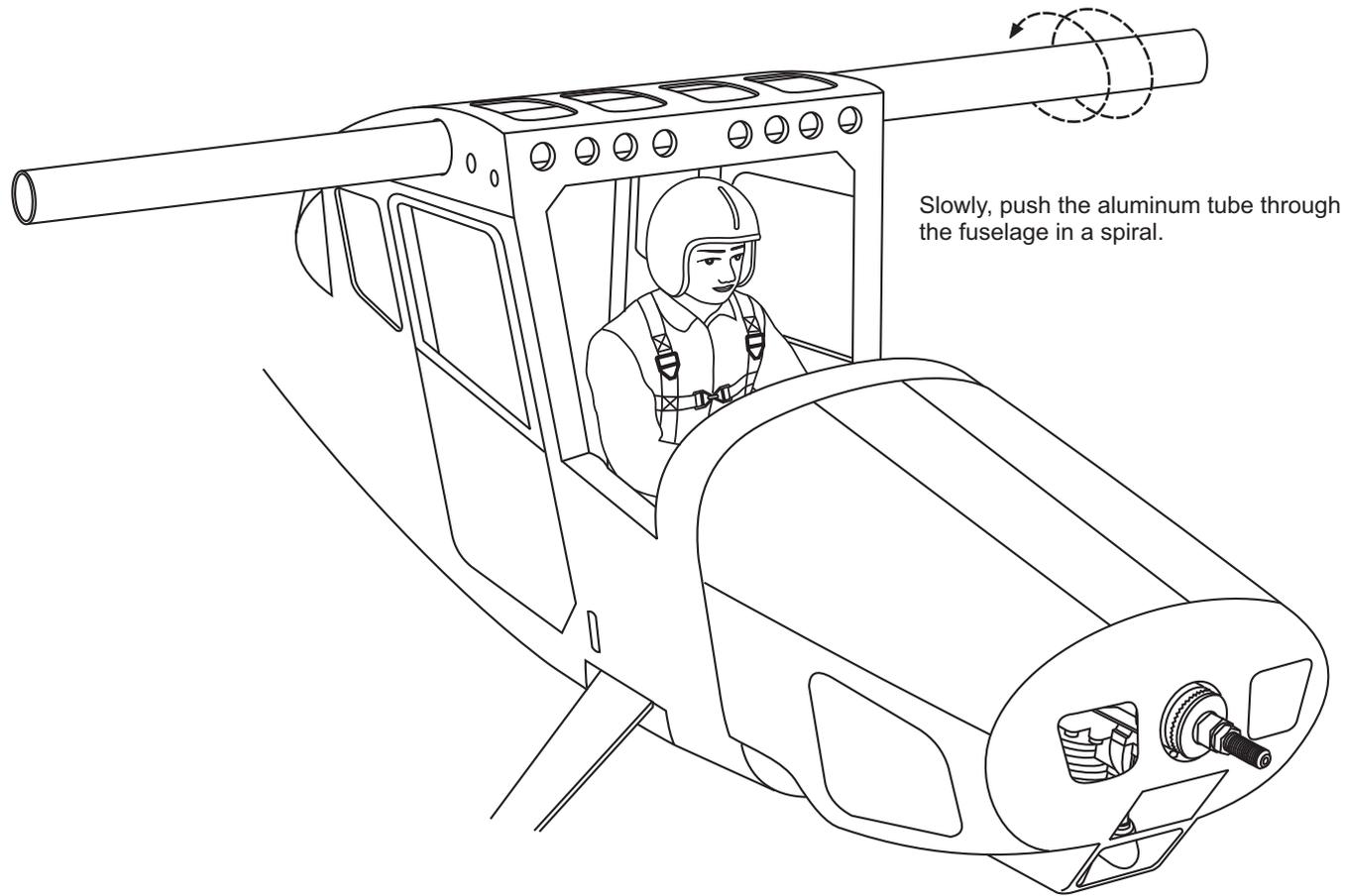
# L-19 BIRD-DOG 29- WING: ROCKET LAUNCHER



# L-19 BIRD-DOG 30- WING: DOWEL

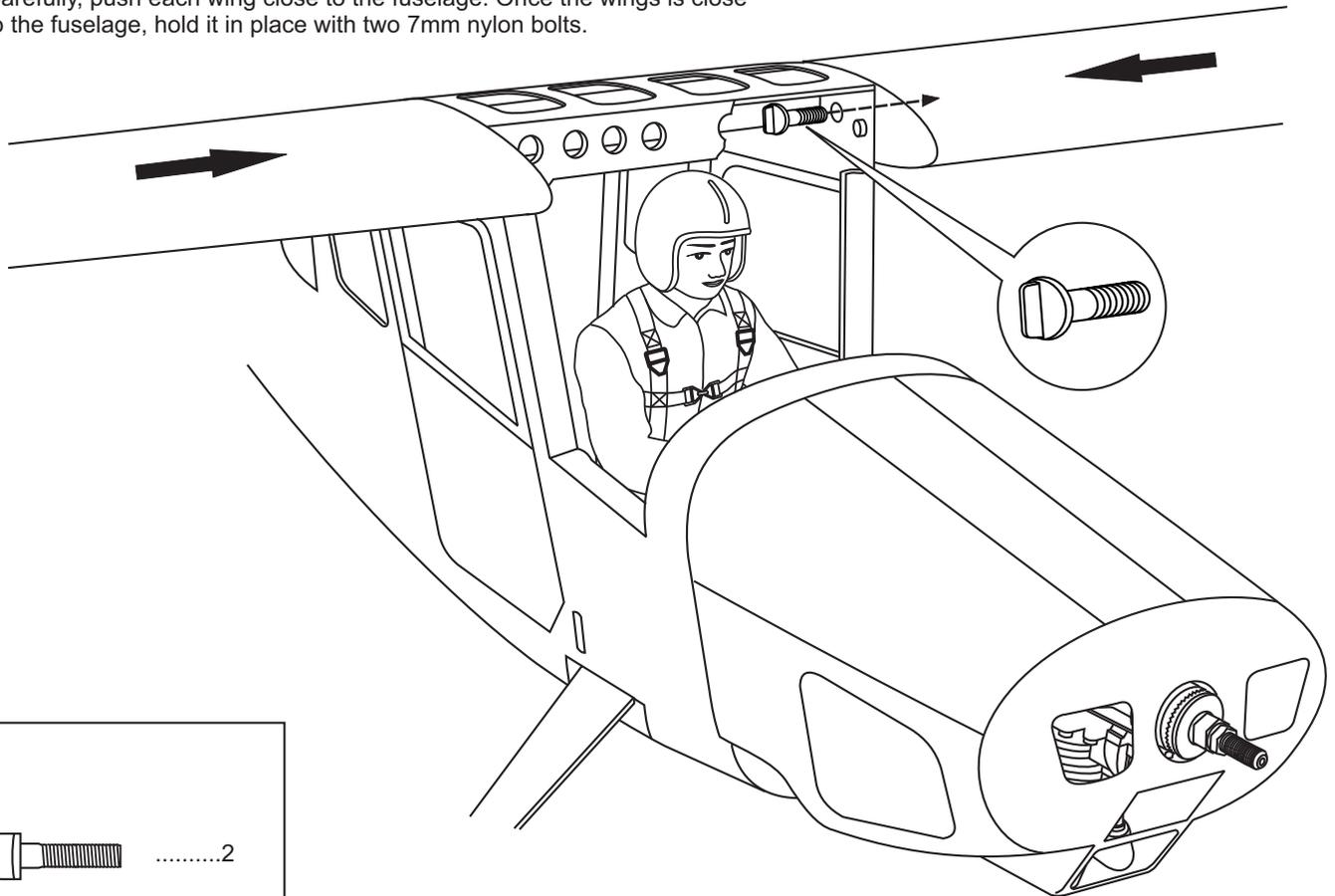


# L-19 BIRD-DOG 31- JOINING THE WING

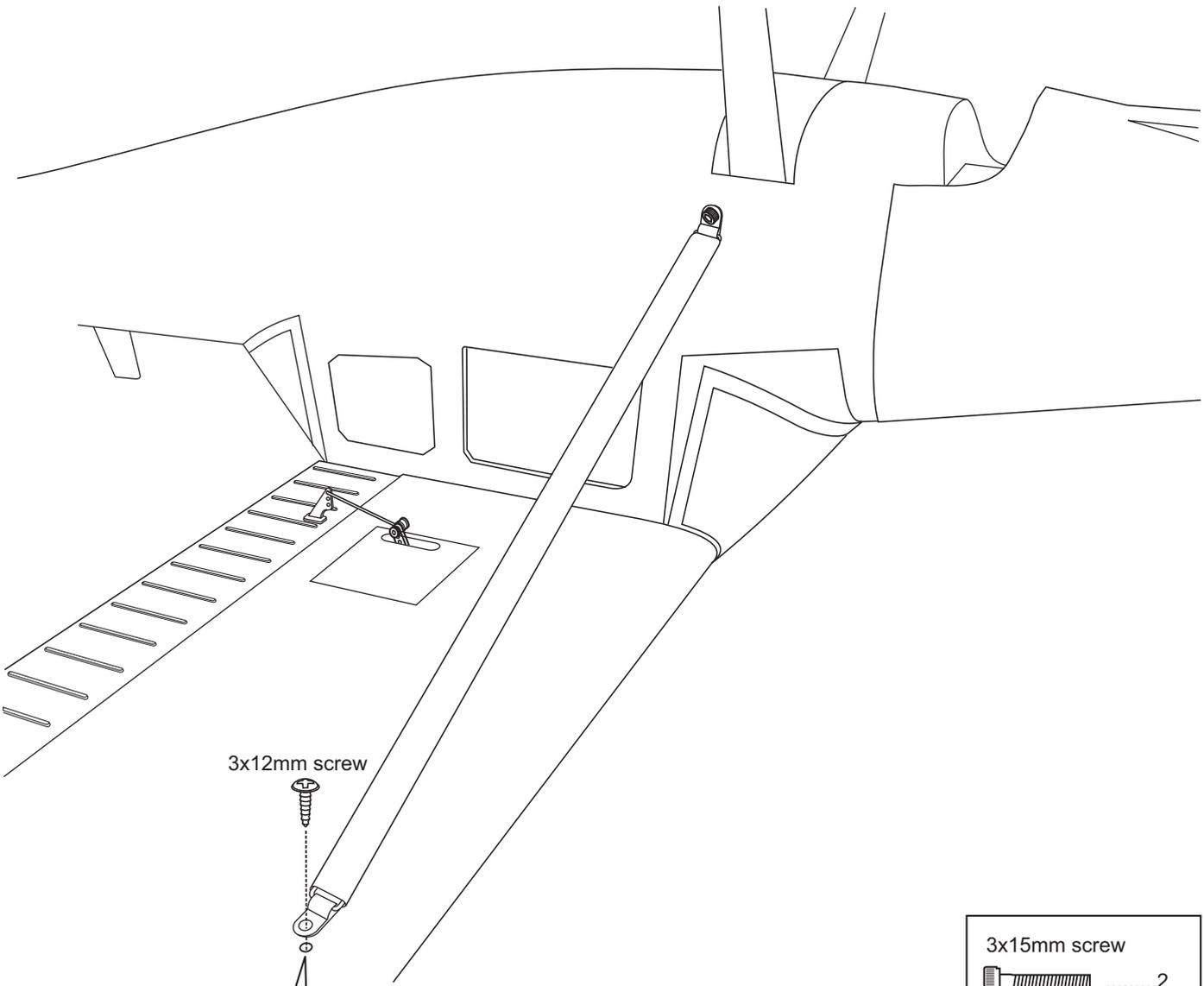
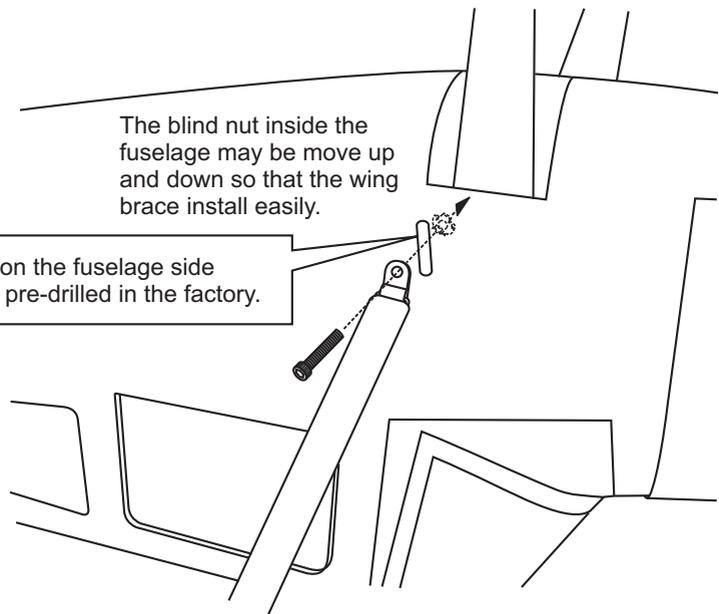


Slowly, push the aluminum tube through the fuselage in a spiral.

Carefully, push each wing close to the fuselage. Once the wings is close to the fuselage, hold it in place with two 7mm nylon bolts.

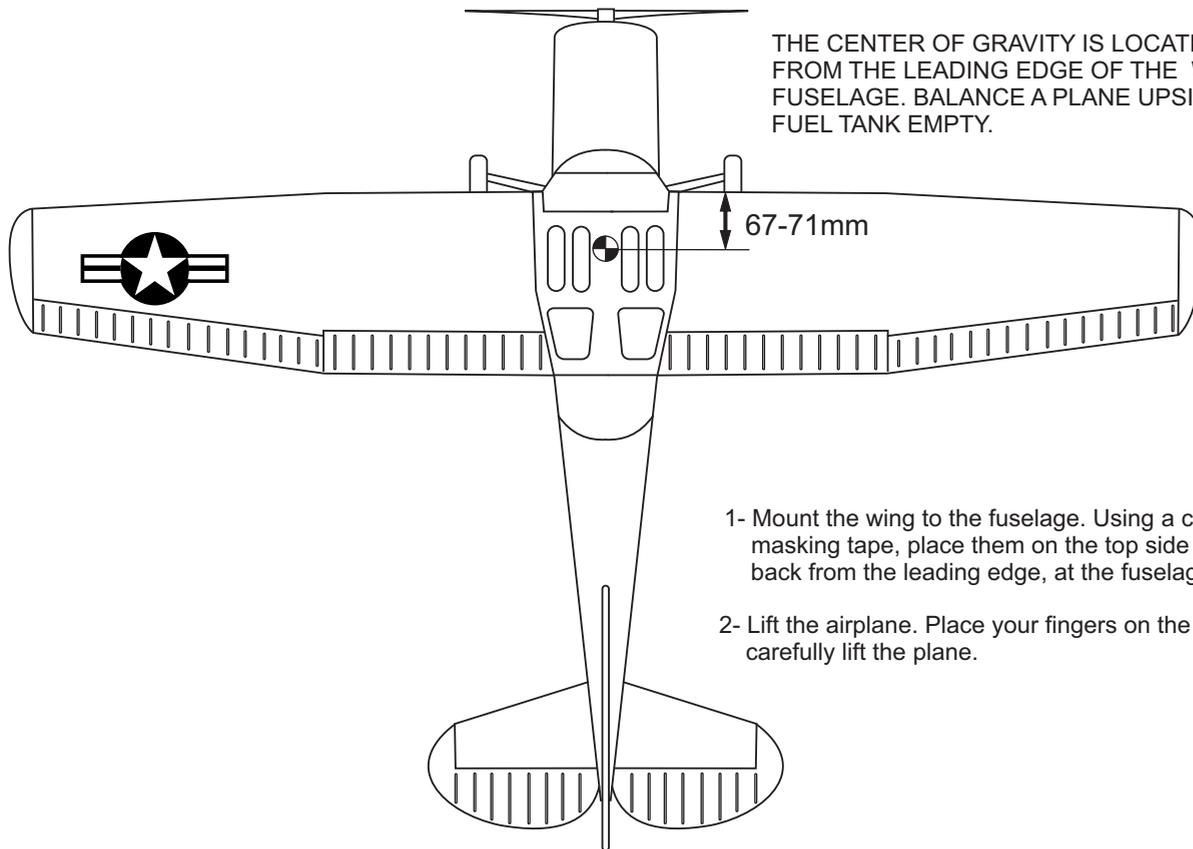


# L-19 BIRD-DOG 32- WING BRACE



- |   |        |
|---|--------|
| 3x15mm screw  | .....2 |
|  | .....2 |
| 3x12mm screw  | .....2 |
|  | .....2 |

# L-19 BIRD-DOG 33- BALANCE



THE CENTER OF GRAVITY IS LOCATED 67 - 71mm BACK FROM THE LEADING EDGE OF THE WING, AT THE FUSELAGE. BALANCE A PLANE UPSIDE DOWN WITH THE FUEL TANK EMPTY.

- 1- Mount the wing to the fuselage. Using a couple of pieces of masking tape, place them on the top side of the wing (67-71mm) back from the leading edge, at the fuselage sides.
- 2- Lift the airplane. Place your fingers on the masking tape and carefully lift the plane.

- 3- If the nose of the plane falls, the plane is heavy nose. To correct this, move the battery pack further back in the fuselage. If the tail of plane falls, the plane is tail heavy. To correct this, move the battery forward or if this is not possible, stick weight onto the firewall. When balanced correctly, the airplane should level or slightly nose down when you lift it up with your fingers.

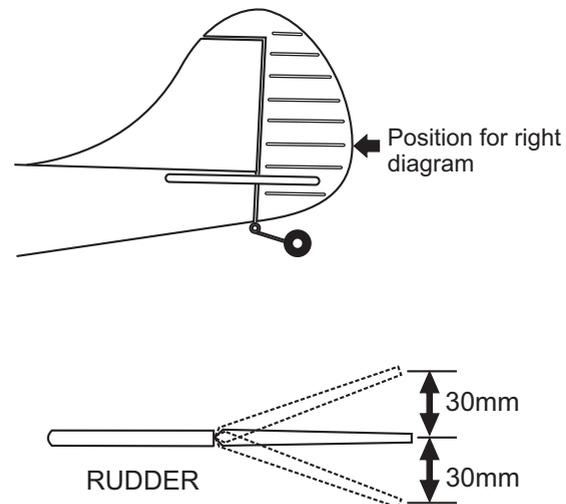
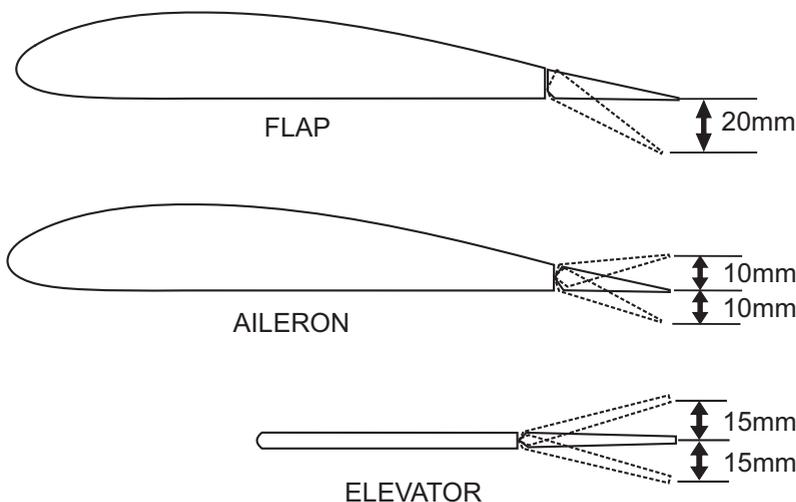
## LATERAL BALANCE:

After you have balanced a plane on the CG, you should laterally balance it. Doing this will help the airplane track straighter.

- 1- Turn the airplane upside down. Attach one loop of heavy string to the engine crankshaft and one to the tail wheel wire. With the wing level, carefully lift the airplane by the string. This may require two people to make easier.
- 2- 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.

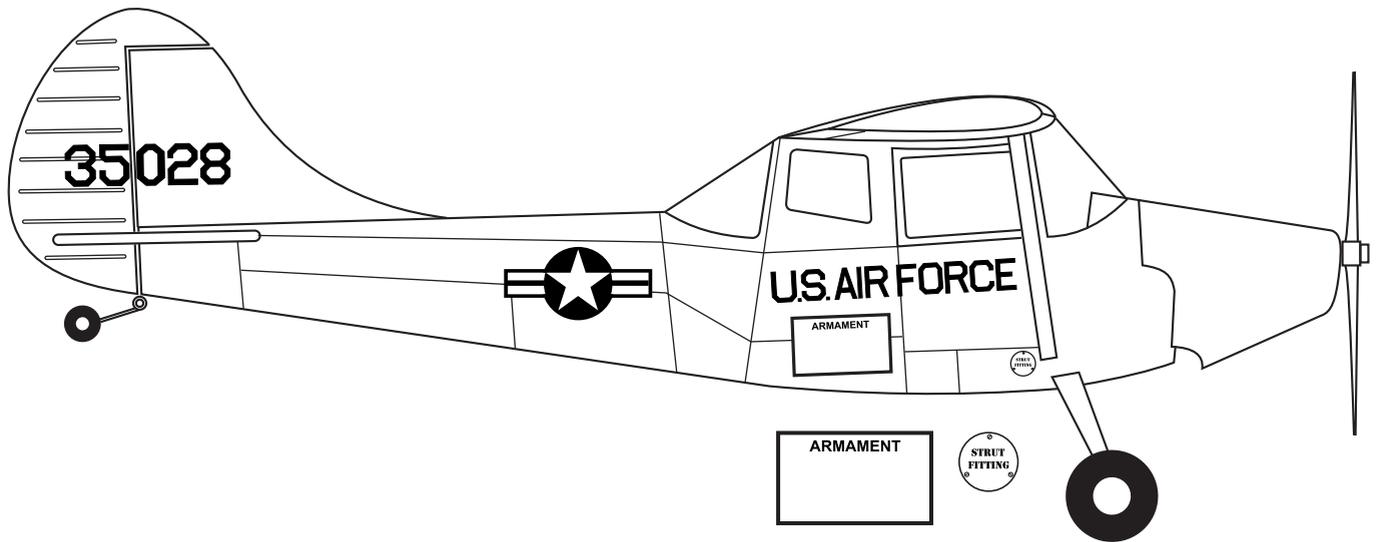
**DO NOT try to fly an out-of-balance model !**

# L-19 BIRD-DOG 34- CONTROL SURFACE

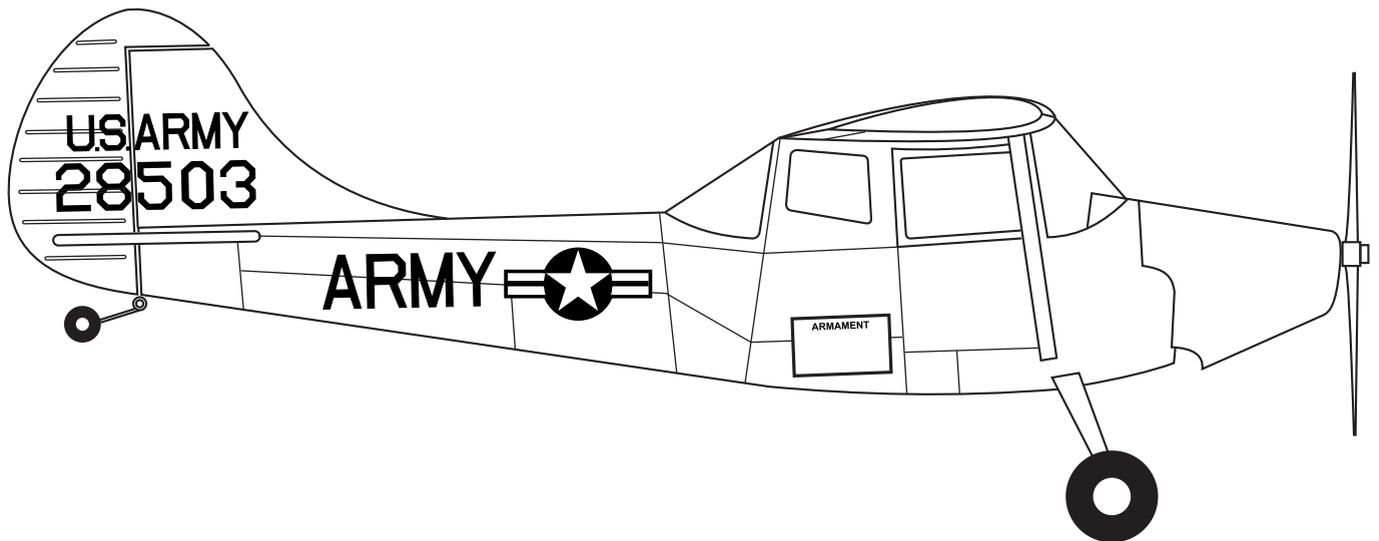
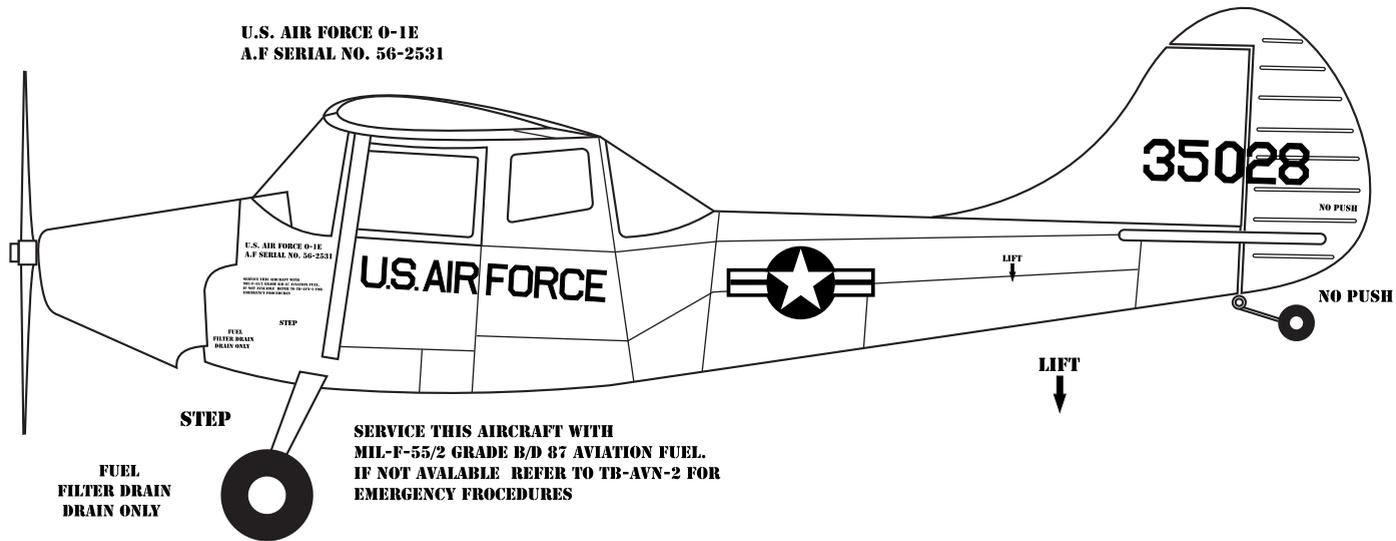


**IMPORTANT:** Flying your model at these throws will provide you with the greatest chance for successful first flights. If, after you have become accustomed to the way the Spitfire flies, you would like to change the throws to suit your taste that is fine. However, too much control throw could make the model difficult to control, so remember, "more is not always better".

# L-19 BIRD-DOG 35- STICKER



U.S. AIR FORCE 0-1E  
A.F SERIAL NO. 56-2531



Note: Cut out the stickers and apply them in the proper area. Do not peel the backing paper off all at once. Peel off one corner of the backing and cut off with scissors. Arrange sticker on model and when satisfied adhere the corner without backing. Carefully peel back the rest of the backing while at the same time adhering the rest of the sticker. Try not to make air bubbles, if there are some, carefully puncture sticker (center of bubble) but not model surface with the tip of the knife or sharp pin and squeeze out the air. At curves stretch sticker and apply a little heat so that no creases occur. Cut off the excess that is produced.

**IMPORTANT:** Please do not clean your model with strong solvent or pure alcohol, only use kerosene to keep the colour of your model not fade.