

COUGAR

2000 V2

Electric or I/C



This is not a toy

The Cougar 2000 is one of Weston UK's high performance ARTF kits designed to provide the ultimate in freestyle and 3D performance. Flick the rates on and with the Cougar's unsurpassable slow speed characteristics it becomes the ideal trainer aircraft.

READ THE INSTRUCTIONS FULLY BEFORE COMMENCING

IF UNSURE ABOUT ANY STAGE OF ASSEMBLY PLEASE CONTACT WESTON UK

MATERIALS REQUIRED FOR COMPLETION

Motor (.36 size 2 stroke recommended motor West Eurotech 36TIR)

Prop (APC 11x4)

Electric motor West 770kv and 60A speed control, 4 cell 3350 lipo, 13x6.5 APC prop
(up to 15 min flight duration)

Electric motor West 770kv and 60A speed control, 3 cell 2200 lipo, 14x7 APC prop
(up to 10 min flight times)

Cyano

Good quality tools and a very sharp blade.

**WE RECOMMEND HITEC RADIO EQUIPMENT AS USED BY
THE WESTON UK DISPLAY TEAM.**

Recommended servos:

Throttle HS 325 Elevator/Ailerons HS 625MG Rudder HS 645MG



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Designed specifically for the Cougar 2000 the West 36 TIR motor and pipe combination gives more power than most 50 size engines. We recommend the West 36 because with the enormous power advantage and minimal weight penalty of this motor (only 290g including motor mount) the Cougar 2000 will perform every trick that it has been designed to do.

Not only will another power plant not perform so well but it will also weigh more which means having to spread the weight further back in the airframe in order to achieve the correct C of G. This then increases the moment arm effect giving a poorer performance, whereas the West 36 package will allow the weight of the radio accessories to be on the C of G giving ultimate performance.

We recommend that if this is your first plane and you have not already joined a club that you do so not only for the safety of yourself and others but for advice. Its always best to get a second opinion if it is your first build and even if you're an expert, and ensure that you contact the BMFA to get your insurance.

Parts list

Fuselage

Tailplane and elevator

Rudder and fin post

Wing

Ailerons x 2

Wheels x 2

Undercarriage

Tail skid

Engine mount

U/C securing plates x 4

U/C securing screws x 8

Wheel collets x 2

control horns x 5

control horn back plates x 3

wing dowels (carbon) x 2

elevator rod (carbon) x 1

elevator push rods x 2

aileron push rods x 2

throttle push rod

clevises x 7

swing keepers x 3

closed loop wire

clevis adjusters x 2

crimps x 4



Recommended motor West 36TIR and Genesis pipe.
(Which produces over 2.2BHP)



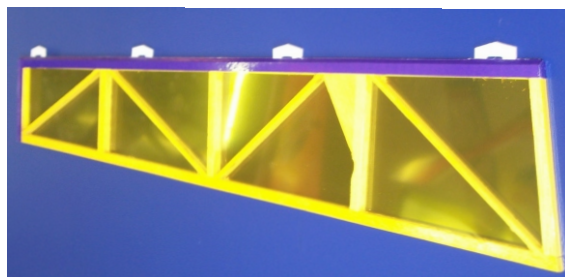
Recommended West 770KV motor and 60A controller, 4 cell 3350 lipo.
(Up to 15mins flying time)

WING



AILERONS

Each aileron has four hinge points pre-cut. Carefully insert the mylar hinges supplied in the accessory pack into the ailerons ensuring that the long cut-out in the centre of the mylar hinge runs parallel to the leading edge of the aileron.

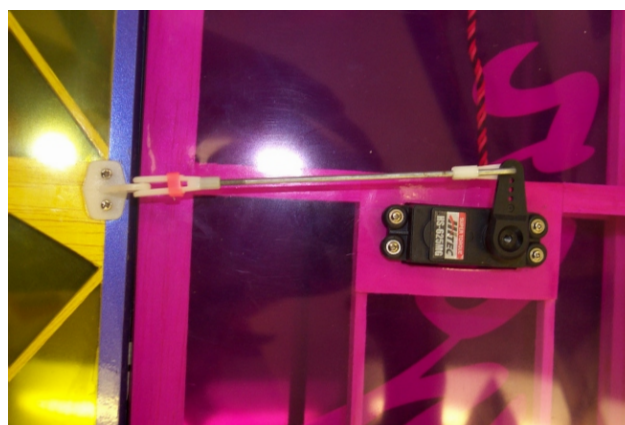
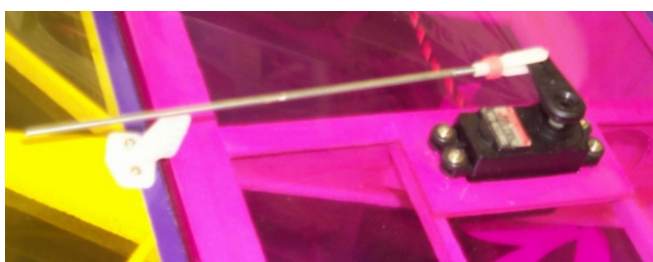


Once in place lock these into position with a couple of drops of thin cyano top and bottom. Ensure the pre-cut slits in the wing align with the mylar hinges in the aileron. When you are happy insert the aileron into the wing so there are no gaps between the wing and the aileron and there is no binding at the edge. Push the aileron down and apply thin cyano to the hinges. Repeat procedure on the opposite side of the same aileron. Repeat procedure on the other aileron.



AILERON SERVOS

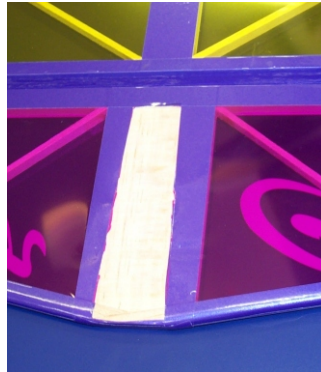
Install a small draw wire through the wing section very carefully ensuring you do not catch any ribs and draw the servo cable through the wing section to the exit point at the centre of the wing. Repeat procedure for the other servo. Secure servos in place with the servo arm forwardmost, take the two aileron pushrods supplied and attach the clevises to the threaded ends. With your servo in the neutral position clip the pushrod onto the servo arm. You can now use this to align the position of your aileron control horns on the aileron over the strengthening points. Once the position has been found, ensuring the clevis attachment point on the horn is positioned over the hinge line, secure into position by drilling and bolting the control horn and backing plate together. Repeat procedure on the other aileron. Disconnect the aileron pushrod clevis from the servo and connect to the control horn. With the servo in the neutral position and the aileron in the neutral position, connect the control rod into the servo arm using the swing keeper. Repeat procedure on the other rod.





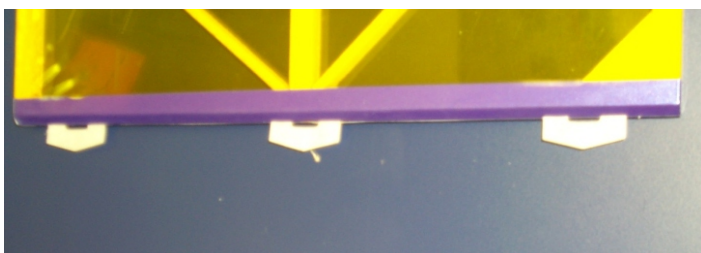
TAIL PLANE

Position the tail plane on the fuselage ensuring that it is correctly aligned. When happy mark out the joining points with a pen and remove the tail plane. Using a very sharp knife remove the film ensuring that you do not cut into the wood. When happy glue the tail plane to the fuselage with epoxy.



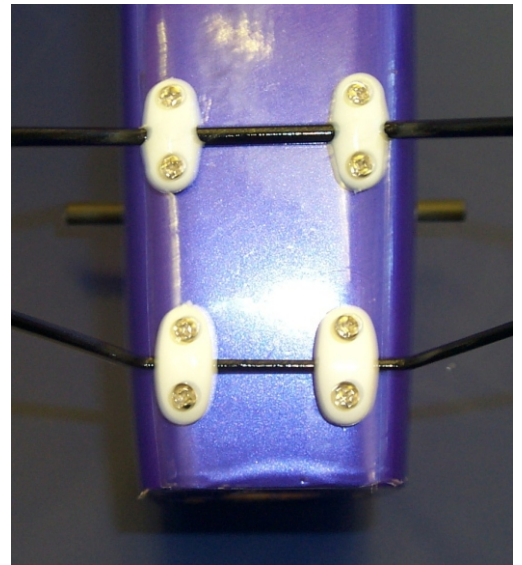
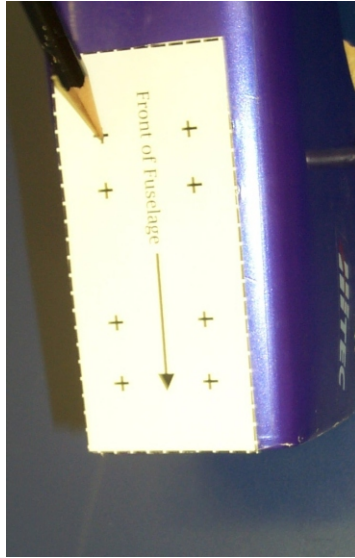
FIN

Insert the fin into the pre-drilled hole in the back of the fuselage and ensure it passes through the fuselage and into its pre-drilled locator in the bottom of the fuselage. If this is not correctly inserted into the fuselage the fin post will not be at the correct angle and when the rudder is attached it may bind against the tail plane. Once in position mark out the fin post point on the fuselage. Remove the film with a sharp knife making sure not to cut into the wood. Reassemble the fin into the fuselage and glue into position. It is advisable to run some glue down at the back of the fuselage internally to secure the carbon rod into the lower part of the fuselage. Insert the mylar hinges into the rudder pre cut slits as per the ailerons. Insert the rudder into the post and ensure there is no binding on the tail plane. When happy secure into position with thin cyano.



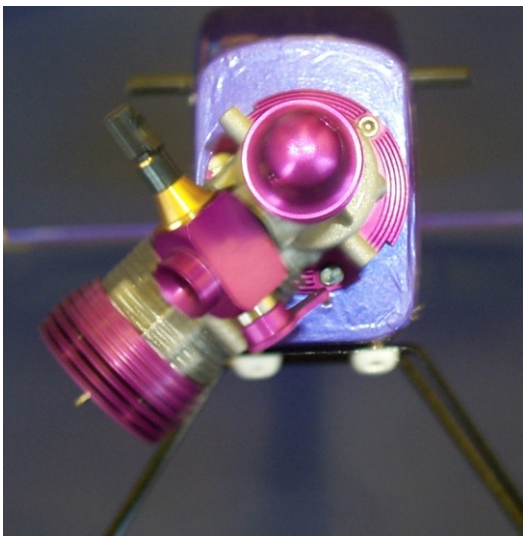
UNDERCARRIAGE

Secure the wheels to the u/c using the wheel collets supplied. Then using the template provided mark the holes for the screws and attach the u/c to the front of the model on the ply plate using the four plastic securing plates and the 10mm self-tapping screws. Make sure when installing the undercarriage that the thin wire of the undercarriage is to the front of the aircraft. Please be aware that the screws do exceed the thickness of the ply plate so will need to be cut down so not to damage either the fuel tank or battery if electric.

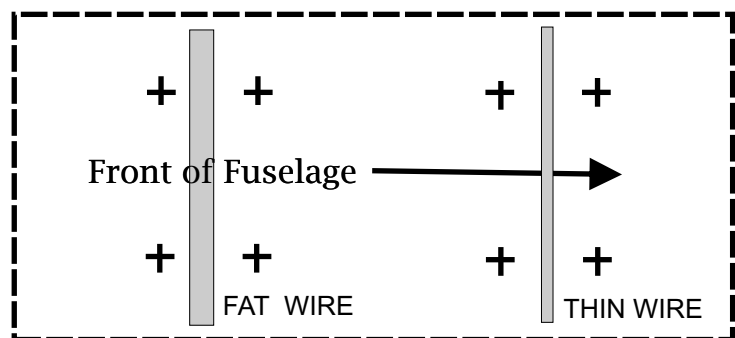


MOTOR

If using the recommended West 36TIR motor simply mount the motor directly to the firewall using the bolts provided so that the head is at the 7 o'clock position. If using the engine mount simply install this using the bolts provided and mount your chosen motor to it so the head is at the 7 o'clock position.

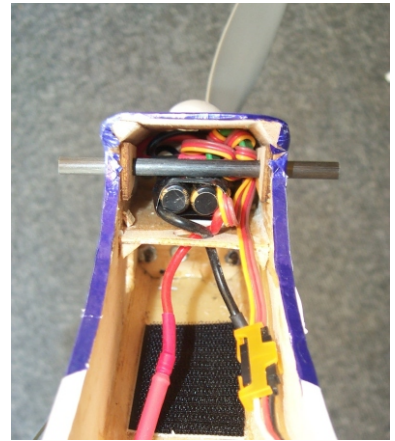
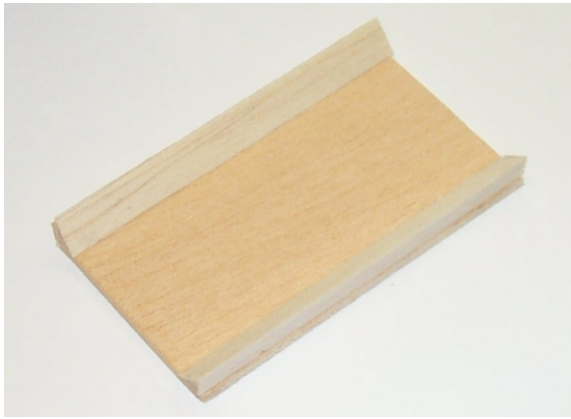


Cougar u/c template



If you are installing the west 770 electric motor simply position the electric motor mount in the centre of the fuel tank outlet hole. Then mark and drill the mounting holes and using the bolts supplied with the electric motor install the capture nuts. It will be necessary to remove one of the pre installed capture nut for the west i/c engine. Before installing the motor it is necessary to drill a small hole above the motor for the wires to enter the fuselage. Once complete install the motor to the firewall.

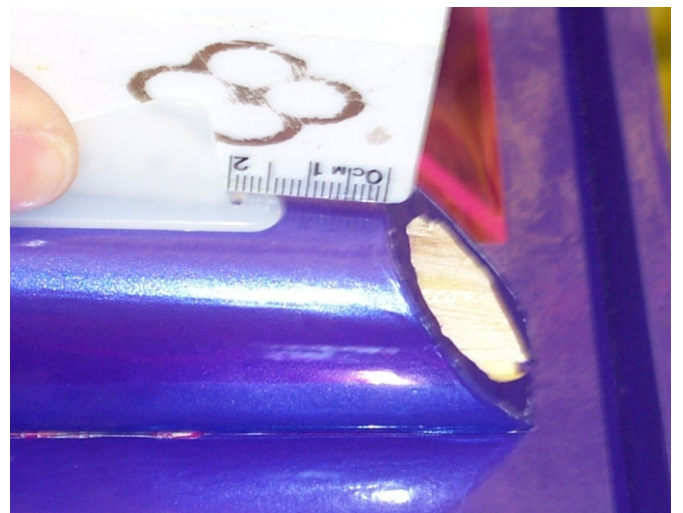




Using the ply plate and triangle re-inforcing install the speed control tray. Use the speed control to set how high the tray can be as you need it to be as high as possible for the lipo access. With the tray in position you can now mark out and cut the holes for the cooling ducts. Make sure the two side ones are below the speed control tray height. Cut and glue the cooling ducts into position and install the speed controller. Run a smooth thin film of 5min epoxy along the bottom of the fuselage and when dry attach some velcro to the bottom of the fuselage for the attaching of the lipo.

TAIL SKID

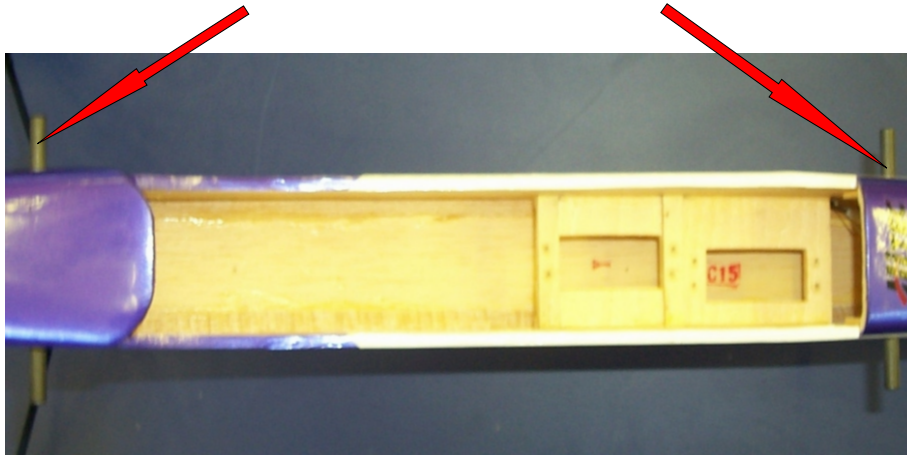
Fit the tail skid 20mm from the rear of the fuselage using the 3 x 8mm self tapping screws.





CARBON WING DOWELS

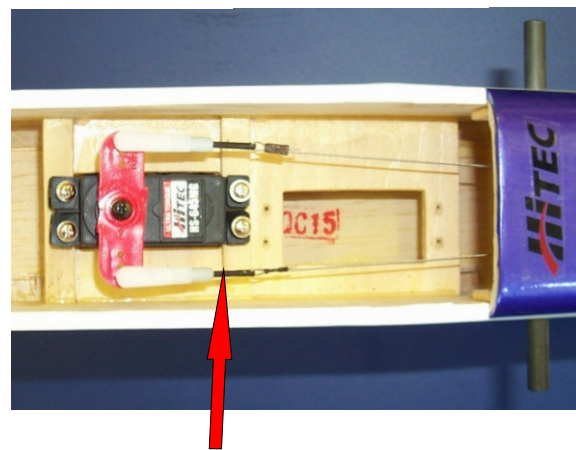
Install the 2 x carbon tubes into the pre-drilled fuselage at either side of the wing and glue in place with thin cyano. Please note it will be necessary to shorten the rear carbon wing dowel so as not to interfere with the aileron movement.



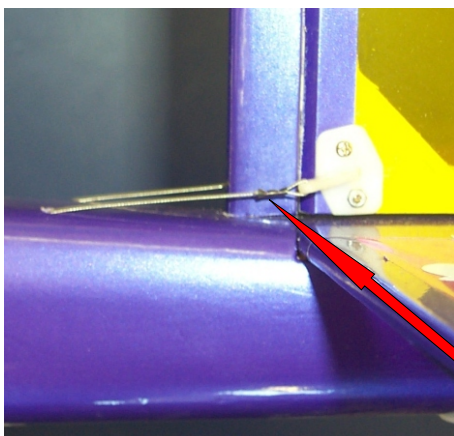
RUDDER SERVO

Install the rudder servo in the raised servo tray with the output arm forwardmost. The rudder utilizes a closed loop system. Install the 2 x control horns onto the rudder over the reinforced area ensuring the clevis attachment points are over the centre of the rudder hinge line. Secure in place with the 2 x 15mm bolts and 2 x nuts ensuring that the horns are at a slight angle so that the closed loop cables when attached are not at an awkward angle. Ensure that your rudder servo is in the neutral position and pass the closed loop wire through the fuselage from the rudder outlet point to the corresponding side of your servo arm. Connect the cable at the rudder using the crimp only. Connect the cable at the servo arm with the crimp, clevis adjuster and clevis. Ensure when doing so that the rudder and servo are in the neutral position. Repeat procedure on the other control wire ensuring you do not twist the wires around each other inside the fuselage.

Rudder servo installed with the output arm forwardmost. With the closed loop circuit complete the cable tensions can be adjusted accordingly. The cable tension should not be so tight to cause the servo to be under strain but also should not be too slack to cause flutter.



The clevis adjuster allows you to take up any slack in the cable.



Rudder control horns at a slight angle to run parallel with the control cables

The closed loop wire is passed through the crimp, then through the control horn and then back through the crimp. This is then crimped with a pair of pliers so the cable cannot move.



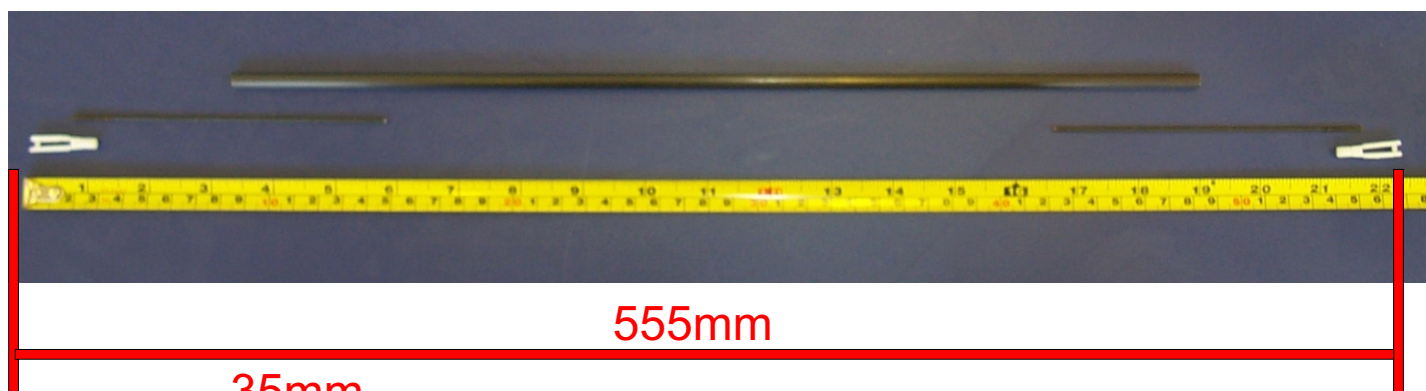
ELEVATOR SERVO AND CONTROL ROD INSTALLATION

Before you make the control rod please take into consideration that the overall length of the control rod needs to be approximately 555mm.

Install the elevator servo in the rearmost servo tray with the output arm at the rear. To make the elevator control push rod, take the 420mm carbon rod and 2 x 130mm metal rods which have to be fitted into the carbon rod. This is done by putting a right angle bend on the unthreaded end of the 130mm rod. Next drill a hole in one side of the carbon rod approximately 35mm from the end. Pass the rod through the middle of the carbon tube so the right angle bend pokes out of the hole. You may need to file the end down so you are able to pass it through the carbon tube. Then push the supplied balsa dowls down the centre of the carbon tube to wedge the control rod in place. When happy glue in place with some thin cyano. Repeat procedure for both ends but ensure that with both ends fitted and the clevises attached the complete push rod assembly is approximately 555mm long from the clevis attachment points. It may be necessary to cut down the carbon rod before the control rods are fitted in order to achieve the correct length. Install the elevator control horn onto the elevator using 1 x control horn, 1 x backing plate and 2 x 15mm screws ensuring that the clevis attachment point is positioned over the hinge line of the control surface and the horn is offset to clear the carbon rod from the fin post. Once installed position the servo and the elevator in the neutral position. Install the elevator push rod adjusting the clevises so as to achieve the neutral position of both the servo and the elevator making sure that the control rod does not bind against the fin post.

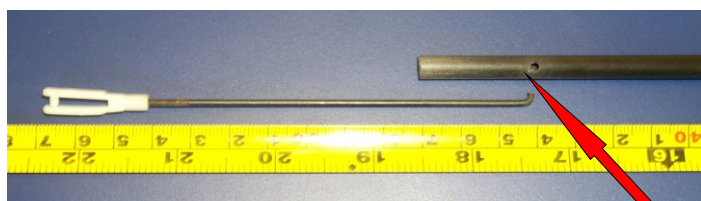


Servo installed with servo arm rearmost.



555mm

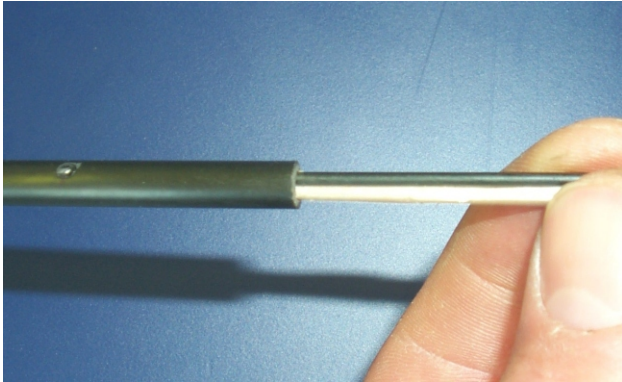
35mm
drill hole



Holes drilled and control rods bent ready to be inserted

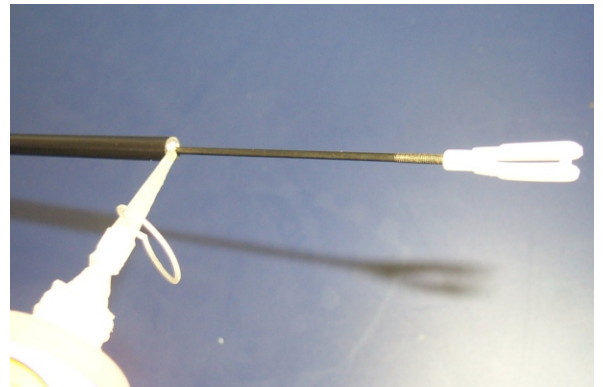


Control rod inserted into carbon tube with the end coming out of the drilled hole.

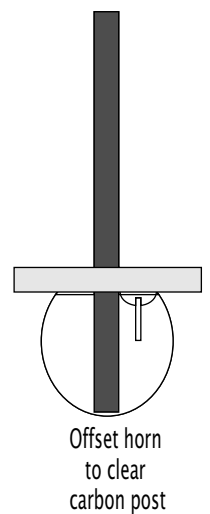


With the control rod inserted the scrap balsa is pushed in to wedge the control rod into place.

With the scrap balsa in place run thin cyano into the balsa.



Use the control rod when connected to the servo to align the elevator control horn over the pivot point of the control surface whilst ensuring the control rod does not bind against the fin post.



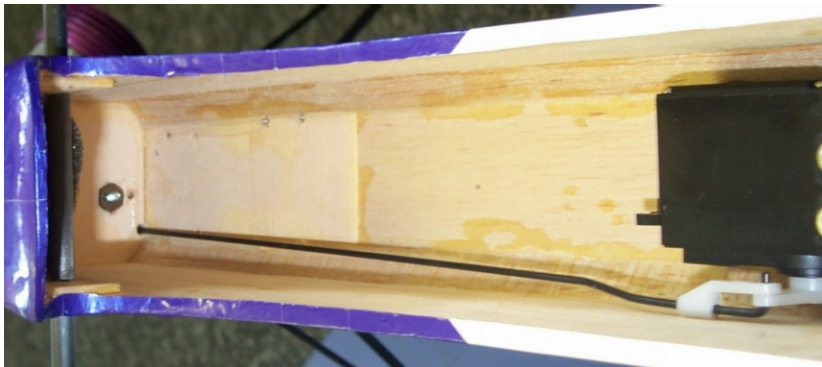
Control rod connected to elevator servo horn.

THROTTLE SERVO

To install the throttle servo it is necessary to make the control rod up as this determines the position of the servo. Take the 290mm x 2mm rod and put the plastic clevis on the threaded end which will be connected to the carburettor throttle lever to prevent any metal to metal contact. A small set will be required in the rod before it goes through the firewall to allow free and easy movement, once the rod has been passed through the throttle servo position can be determined. The throttle servo should be mounted on its side either by servo tape or by epoxy. Epoxy is the more secure way and a good tip is to run some insulation tape round the servo so that if you have to remove the servo you can just cut the tape and remove the servo. The throttle control rod is connected to the throttle servo arm via a swing keeper and may require a set in the control rod to allow free and easy movement. Once attached to the servo glue the servo into place.

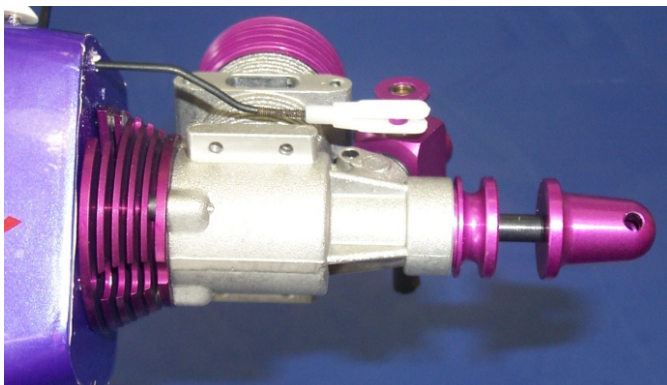


Example of throttle control rod.



Example of throttle control rod running along the bottom of the fuselage.

Example of throttle servo position .



Example of the throttle control rod connection to the West 36TIR

FUEL TANK

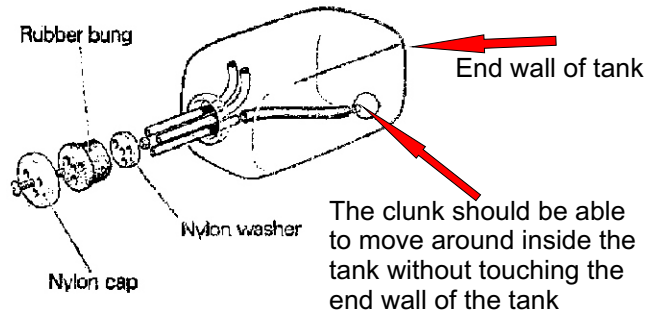
Make the fuel tank up as per the picture and install the tank. It is always good practice to pack foam around the tank in order to reduce any vibration.



ASSEMBLY INSTRUCTIONS FOR R/C CLUNK TANK

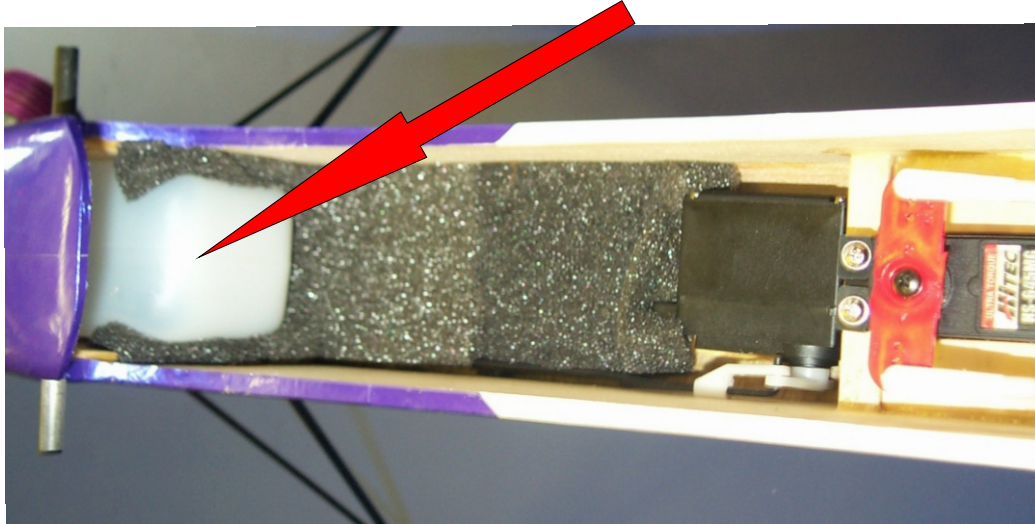
Assemble the parts of the kit as shown in the diagram but do NOT tighten up the nut and bolt before inserting the assembly into the neck of the bottle.

After insertion tighten up the bolt which will result in the rubber bung expanding in the bottle neck and making a perfect leak-proof seal.



It will be necessary to bend two of the straight pipes to go to the top of the tank, 1 x for filling, 1 x for exhaust pressure, the other straight pipe is for the clunk which will be connected to the carb

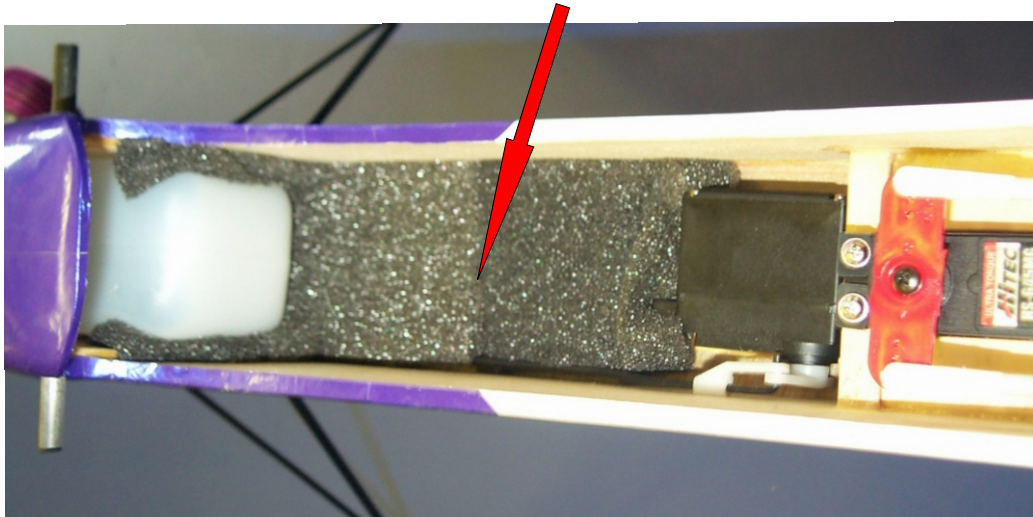
Tank installed with foam to reduce any vibration.



RECEIVER AND BATTERY INSTALLATION

The receiver and battery are installed behind the tank bay. You should always restrain all plugs and the crystal to prevent any migration and pack the receiver in foam to reduce any vibration. The battery is positioned to obtain the required C of G.

Battery and receiver installation area



C of G

For beginners:-100mm - 115mm from the leading edge of the wing

For expert :- 115mm - 135mm from the leading edge of the wing

CONTROL MOVEMENT

BEGINNERS: - Ailerons 15mm up and down	ADVANCED:- Max movement
Elevators 25mm up and down	Max movement
Rudder 25mm up and down	Max movement

EXPO :- 15% - 35% all control surfaces

FLAPPERONS + SPOILERONS

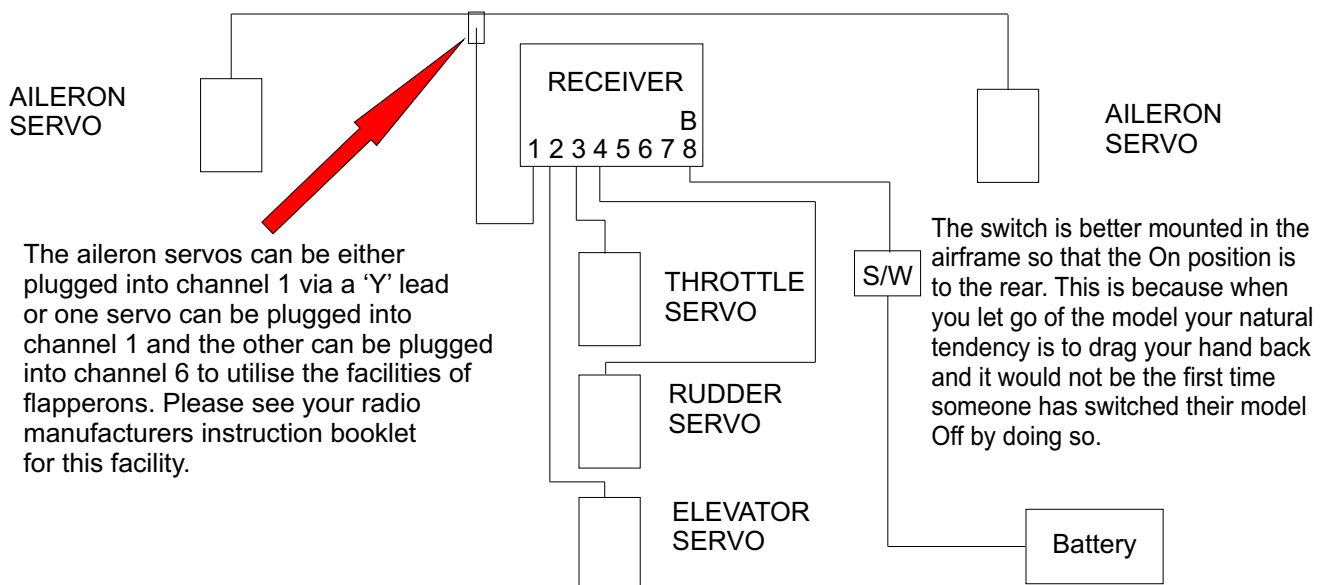
Flapperons and spoilerons can aid the advanced flight characteristics of the Cougar giving some incredible hover and tight-manoevre capabilities.

REMEMBER

Before flying check your model thoroughly and do a range check with the engine running, check all electrical connectors are restrained and ensure that the receiver is padded to reduce any vibration.

We trust you will have many happy hours of flying this model and if you have any questions do not hesitate to contact us.

Installation wiring diagram for Futaba / Hitec (mode II)



Its always good practice to lead lock all servo connections, switches and batteries to ensure they do not become disconnected during flight. It is also good practice to run the receiver arial away from any of the servos so no interference is picked up by the motors in the servos. Another good tip is to use clevis keepers on all clevises. This is simply a small piece of fuel tubing slid over the clevis to keep it pinched together.

Safety

Always remember to treat your engine with respect and as soon as you connect your glow clip to your engine to treat it as if it was running. Always keep your distance from the propeller and stand behind the engine and propeller when you are doing high speed ground running ensuring that the plane is firmly restrained. Do not fly if you are unsure that you are capable of doing so and make sure that you have 3rd party insurance and have joined a club. Any needle adjustments should be done from behind the propeller ensuring you keep well clear.