

ARF MODEL

SBACH300 20CC V2

Instruction Manual

This plane is designed for electric motor. It can also be flied with nitro and gas engine.



Dear Customer,

Thanks for purchasing this newly designed SBACH300 aerobatic RC airplane. This plane is to be powered by brushless motor. It can also be flired by nitro and gas engine. Its weight is about 8.5Lbs. It's good for imac and free flight. It's a beautiful plane with amazing flight performance. It's covered with genuine monocote, and comes with good quality accessories, including carbon fiber wing tube, carbon fiber or Anodized 6061 Aluminum landing gear as an option. We hope you like this plane.

The new V2 version of SBAHC300 20CC has the following Improvements than V1 Previous versions:

1. Control services is larger than V1 version. Up to 50 degrees of throw on all control surfaces. Best for more vibrant aerobatic flight.
2. Improved wheels with more durable materials, and filled with rubber.
3. Using high quality cap head screws.
4. Improved ball link assembly.
5. Canopy extended into cowl for easier motoe battery access.
6. Flat nylon hinges for better flying strength
7. Include Side Force Generator's(SFG)
8. The air exit for the electric set up still needs to be inside the fuselage behind the rudder tray.

A QUICK WORD ABOUT SAFETY AND RADIO

CONTROL FLYING MODELS

With radio control aircraft, like any hobby or sport, there are certain risks. The operator of these models is responsible for these risks. If misused or abused, you may cause serious bodily injury and/or damage to property. With this in mind, you will want to be certain that you build your model carefully and correctly. If you are not an experienced flier, have your work checked and ask for help in learning to fly safely. **This model aircraft is not a toy** and must be operated and flown in a safe manner at all times. Always perform a pre-flight check of the model including all control surfaces, proper function of the radio gear, structure, radio range, and any other area relating to the safe operation of this aircraft.

Models are not insurable but operators are. You can obtain coverage through membership in the Academy of Model Aeronautics (AMA). For an AMA information package call 1-800-435-9262, ext. 292 or visit the AMA website at "www.modelaircraft.org".

By the act of using the final assembled model, the purchaser/operator accepts all resulting liability.

ARF MODELS WARRANTY AND RETURN POLICY

We guarantee that the plane is in perfect condition at purchase. The warranty will be voided after modifications and usages. If you have any questions or find any issues, please contact the distributors in your area. For US customers, please contact General Hobby. Their website is www.generalhobby.com. Their phone number is 909-581-8873. Customers in other areas please contact the sellers you purchased it from.

SPECIFICATIONS

Wing Span: 68"(1720mm)

Length: 65"(1650mm)

Wing Area: 946sq in(61sq .dm.)

Flying Weight: 8-8.8lbs(3600-4000g) Depending on battery size used

Engine: .70-.91 (2C) .91-.110 (4C) 20-26cc gas

Electric Power:

Hacker A50-16S with 6S 3800-4400mAh 17x8 or 18x8 prop

DUSKY XM5060EA-470KV with 6S 3700-4400 mAh 17x8 prop

Or other 1500-1800Watt electric motor

ESC: 80A

RADIO:4CH/4-6S

Features:

Newly designed structure

Two pieces removable wings

Aerofoil tail wings

PVC canopy

Power: standard for Electric, capable for Gas engine

Larger aileron and elevator design for excellent 3D aerobatic flying



The air exit for the electric set up still needs to be inside the fuselage behind the rudder tray.



Include Side Force Generator's(SFG)



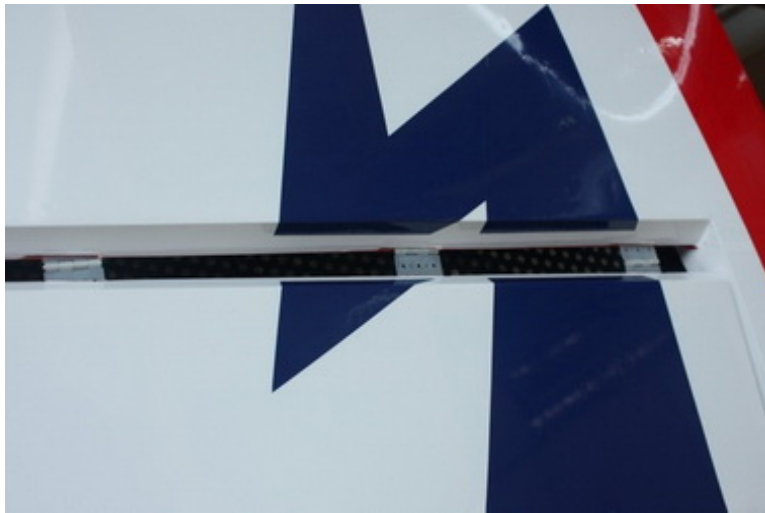
Servo extension safety connector clips



High performance cap head screws



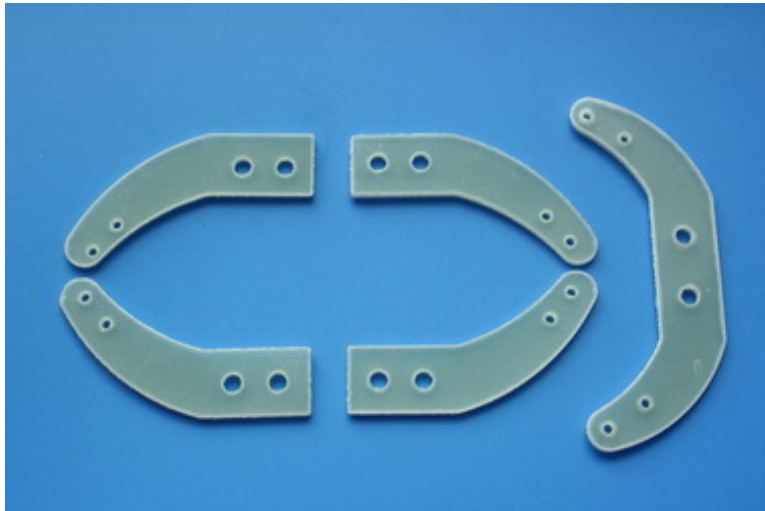
Flat nylon hinges for better flying strength



High quality 2.5mm ball links assemblies



Fiberglass horn assembly



High-quality durable rubber wheels



Two options for landing gear: Anodized 6061 Aluminum or Carbon fiber

Anodized 6061 Aluminum landing gear



Carbon fiber landing gear



Carbon fiber wing tube



Two improvements for easier battery access:

Canopy extended into cowl





Canopy quick release mechanism



It can also be powered by gas engine.



Scheme A white/ red / black



Scheme B white/ red / blue







Items Required to Complete This Model:

- 1500-1800Watt electric Motor or 20-26CC Gas
- Appropriate propeller for your Motor
- All required engine and exhaust mounting hardware
- Ignition battery and switch
- One quality throttle servo and appropriate servo arm
- 5-6Pcs high quality metal gear servos or better for the ailerons and elevators
- Appropriate servo arms for the above
- Servo wire extensions. recommends five 12"
- Two switches with charging jacks for the Rx
- Two high quality Rx batteries of significant capacity to power your choice of servos.
- One Receiver of your choice

Shop Supplies/Tools

- Covering Iron and heat gun
- Assortment normal hobby tools such as screwdrivers, hobby knife, drill and drill bits, pliers, etc.
- Thick and Thin CA adhesives
- 30 minute Epoxy
- Isopropyl alcohol
- Ruler or tape measure
- Blue thread-lock or equivalent
-

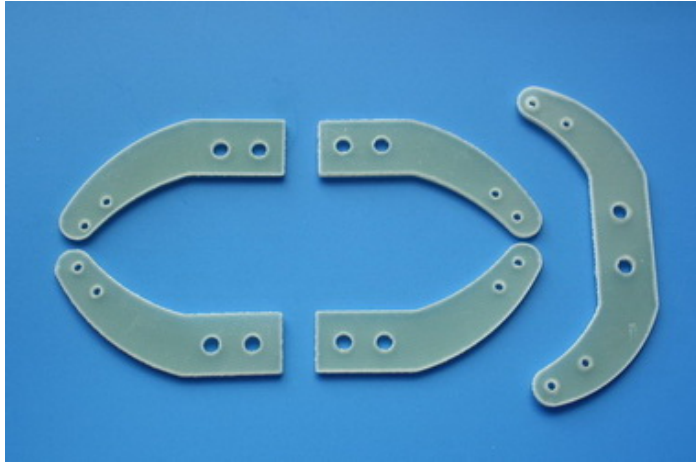
Note: As with all kits, it's a good idea to read all the instructions and study the parts before you begin construction. Handle the parts of this kit with care so you do not damage any of the structure or covering. Inspect all the parts for any shipping damage and report any issues to as soon as you can. Make sure you have a flat and sturdy workbench and follow all safety advice for the tools and adhesives you plan to use.

AIRCRAFT COVERING

1. With all ARFs, varying temperatures and storage delays can cause covering material to loosen over time and transportation. recommends lightly going over all the covering with a covering iron set at medium temperatures. Be sure to use a soft cover over your iron so you do not scratch the covering surface. Be sure you go over all seams and edges of the covering to assure it is secure to the airframe and other covering. Be careful not to apply too much heat or you may cause bubbles or damage to the covering. A heat gun may also be used along with a soft cotton cloth to shrink and adhere the covering. Again, be extremely careful when using a heat gun.
2. Be sure to seal any exposed wood with a thin coating of epoxy to prevent engine oil from soaking in. This is especially important around the engine compartment and servo openings with exposed areas.
3. Some modelers prefer to seal the hinge gaps using strips of appropriate covering or clear trim tape. We have found this to be helpful with models intended for higher speed flight or models with unusually large hinge gaps. aircraft utilize a very tight double beveled hinge line and do not normally require this step. Sealing the hinge gaps is therefore left as an option for the modeler.

Please verify the accessories before assemble:

Fiber glass servo horns: 4 single horns for ailerons and elevator. 1 dual horns for rudder.



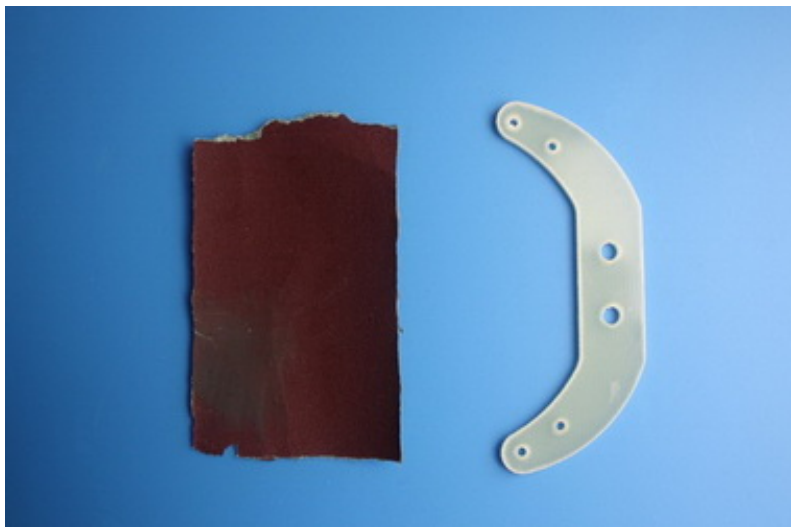
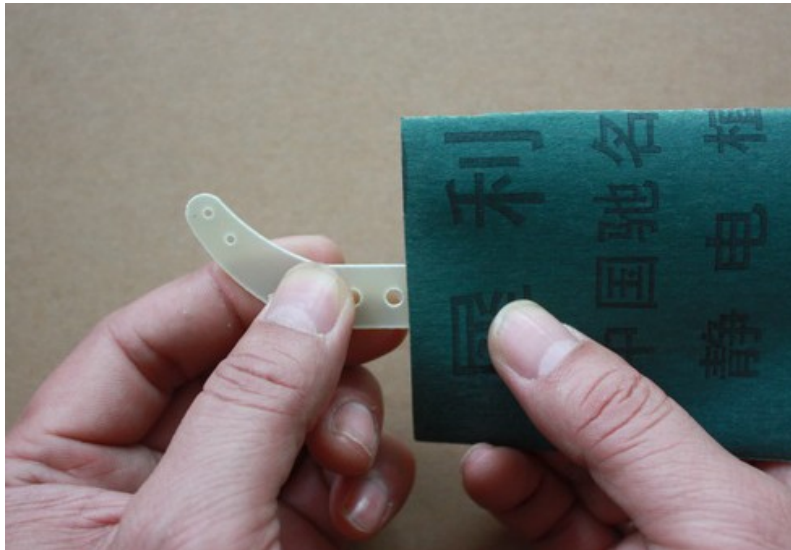
There is a layer of protection film on the horns. Please remove the film as shown following picture.



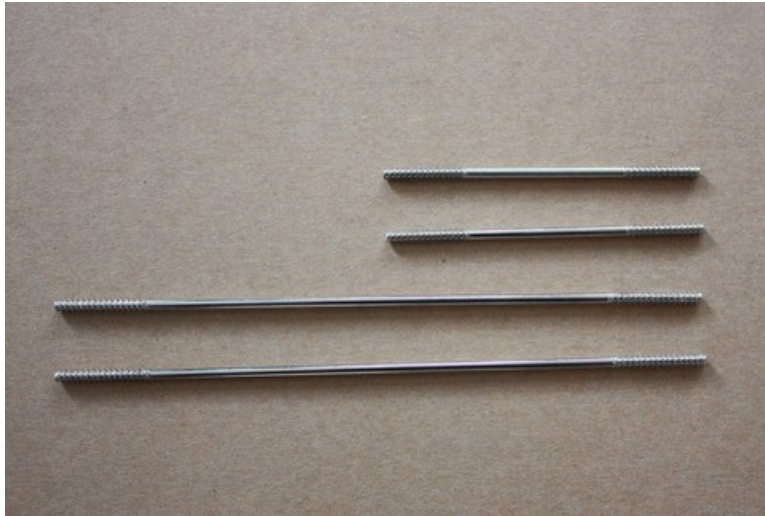
Drill holes with 2.5mm drill.



Make sure to sand the horns to keep its strength.



Pushrods: Two 2.5x60mm for aileron. Two 2.5x110mm for elevator (you have option to use one or two servos).



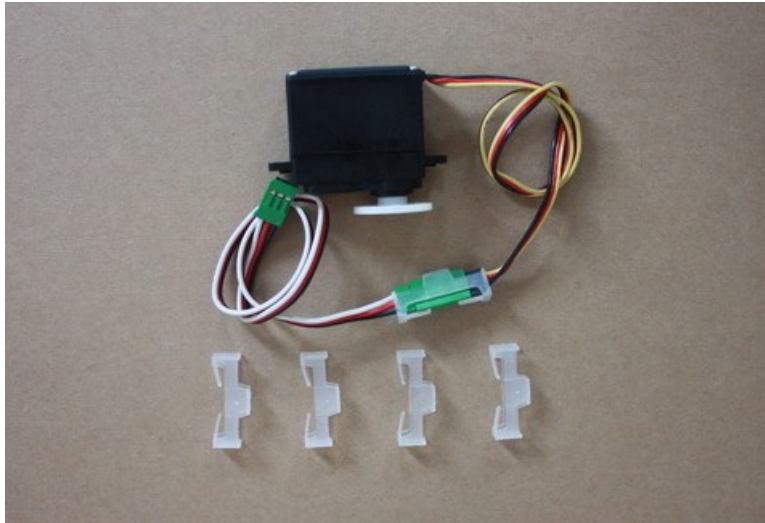
Ball links: 8 for aileron and elevator.



Pull-pull setup for the rudder.



5 Servo extension safety connector clips



Tail wheel assembly.



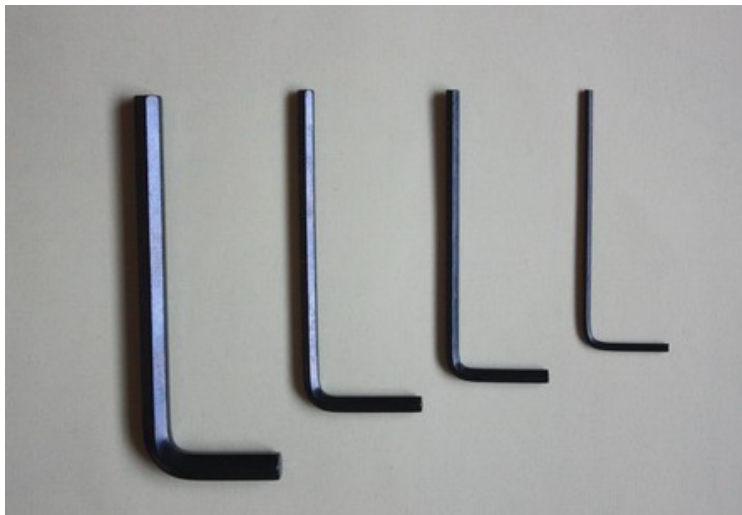
Screws for landing gear: 4(4x20mm) Hexagon socket screw



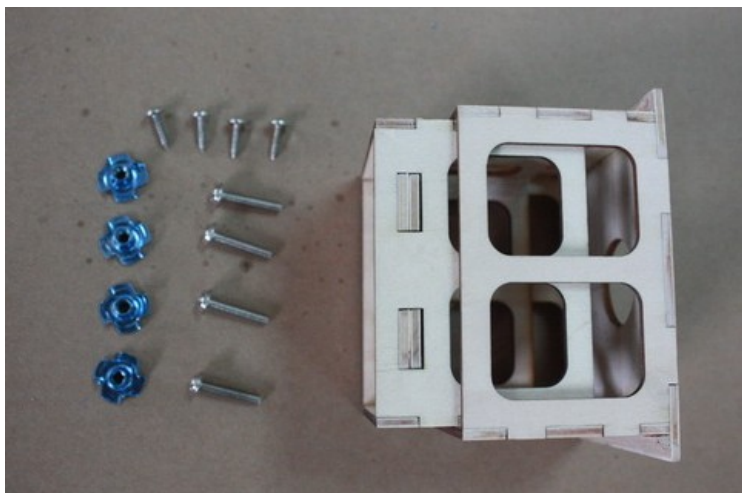
Screws & Washers for cowl: 4(3x12mm) Hexagon socket screws & 4 Washers



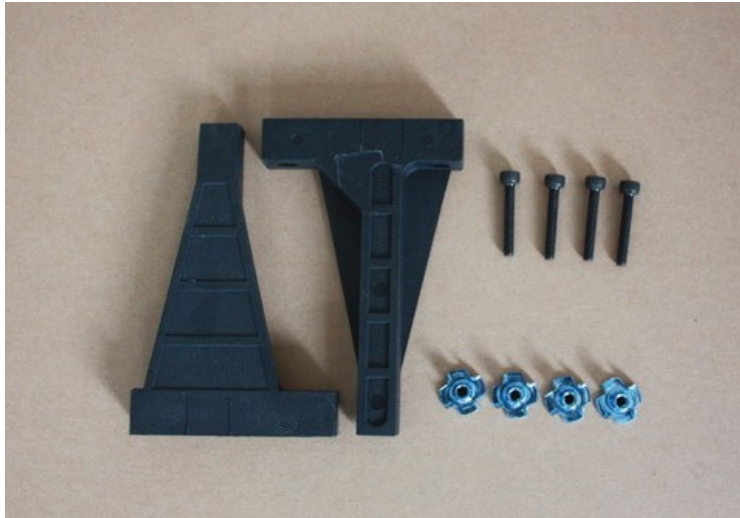
4 Hexagon socket screw wrenches



Motor mount for brushless motor



Engine mount for nitro and gas engine



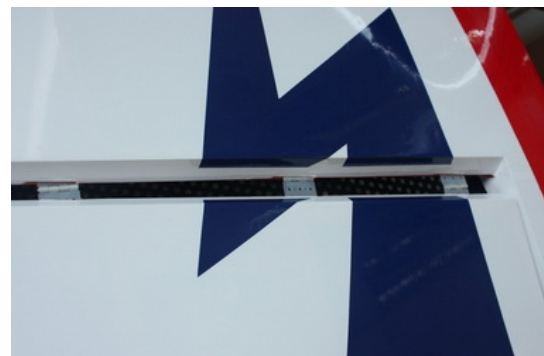
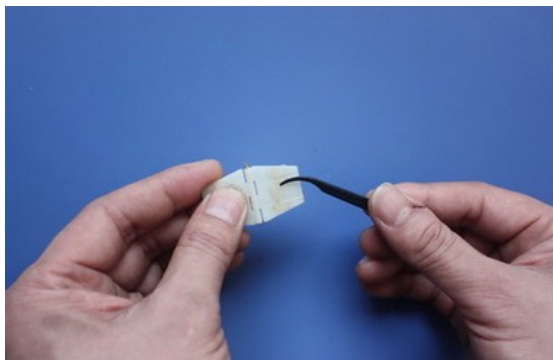
Wing Assembly

1. It is much easier to install the twin control horns before installing the wing. Locate the fiberglass aileron control horns, ball links, and associated bolts and nylon-insert lock nuts. Use some fine sandpaper to roughen up the center areas of the two control horns so that the glue adheres better. Using a sharp hobby knife cut the covering away from the slots in the rudder and trial fit the two control horns.
2. Mix up some 30 minute epoxy and coat the inside of the slots and the center of the control horns. Hint: a scrap piece of 1/16" ply, tooth pick, or old hobby blade can be used to coat the inside of the aileron slots. Slide the control horns in place and make sure they are centered perfectly by using a ruler to measure between the pivot holes and the hinge line. Wipe any excess glue off with isopropyl alcohol and paper towels. Install the ball links, bolts and nuts into the holes to help assure alignment of both control horns while the glue cures. Set aside until cured.





3. The slots for the supplied hinges are pre cut. Locate the hinges and dry fit the hinges and aileron into place and test the operation. The hinges should seat fully into the slots so that the hinge line gap is minimal while still allowing full aileron deflection.
4. Before gluing the hinges in you must first clean the hinges of any mold release agent using isopropyl alcohol. also recommends scuffing up the plastic with light sandpaper for maximum glue adhesion.
5. Mix up some 30 minute epoxy and using a toothpick or small wooden dowel coat the inside of each hinge slot with epoxy. Also put a thin layer of epoxy on one side of the hinges. Install this end into the slots of the rudder and make sure each hinge is properly aligned at exactly 90 degrees to the hinge line.
6. Now coat the other end of the hinges with epoxy and install the aileron into the trailing edge of the wing. Again, make sure the hinges remain in proper alignment. Using paper towels and some isopropyl alcohol clean off any excess epoxy from the hinges and surrounding areas.
7. Make sure the aileron is fully seated so that the hinge gap is minimal while still allowing full deflection of the aileron. When satisfied, use some masking tape to hold the aileron in place along the bottom and counterbalance. After the epoxy has cured, remove the masking tape and check for proper operation. If the hinges are dry some light oil carefully placed on each hinge will help greatly.



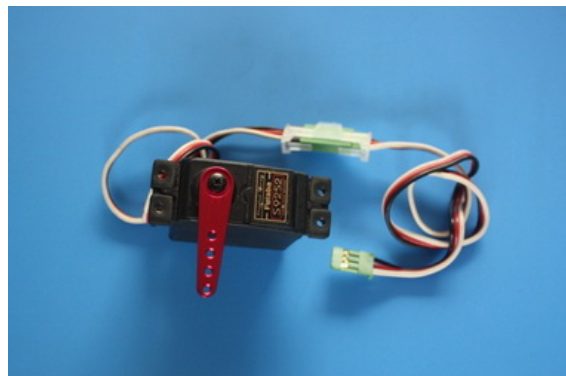


8. Cut the covering from the aileron servo openings from corner to corner and iron down inside the openings. Connect servo wire extensions to your servos and secure the connections with the supplied clips, your own clips, or tape. Feed the servo wires into the wing and out the root. Install the servos and screw firmly in place.

9. Use your radio to set the centers of each servo and then assemble and adjust the length of each control rod. The servo arm should be as close to perpendicular to the control rod as possible while the aileron is at neutral. Double check all screws, bolts and nuts to assure proper installation and operation without binding. Once satisfied, permanently attach the ball link to the servo arm with the supplied screw and nut.

9. Check the final radio operation of the ailerons and make sure there is no binding or servo fighting of each other. Also check to make sure all linkage bolts and nuts are secure.

(Below long ALU arm is not included)



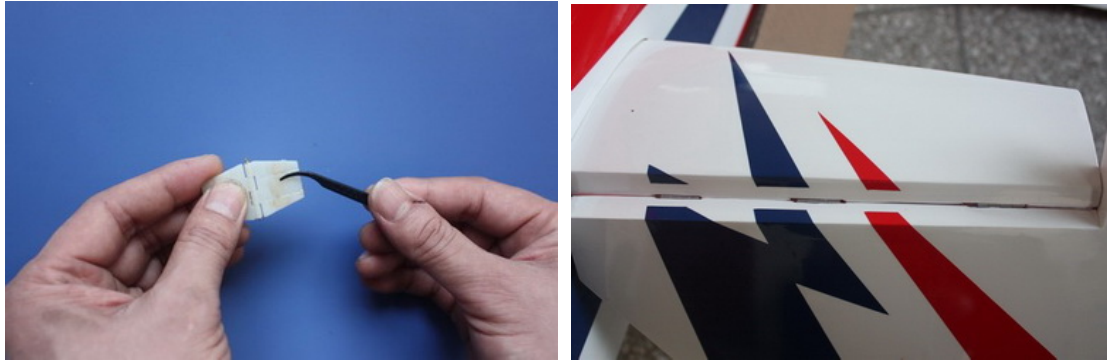


Elevator Assembly

1. Cut the covering over the hole for elevator on the fuselage. Glue the elevator to the fuselage. Make sure it's centered.

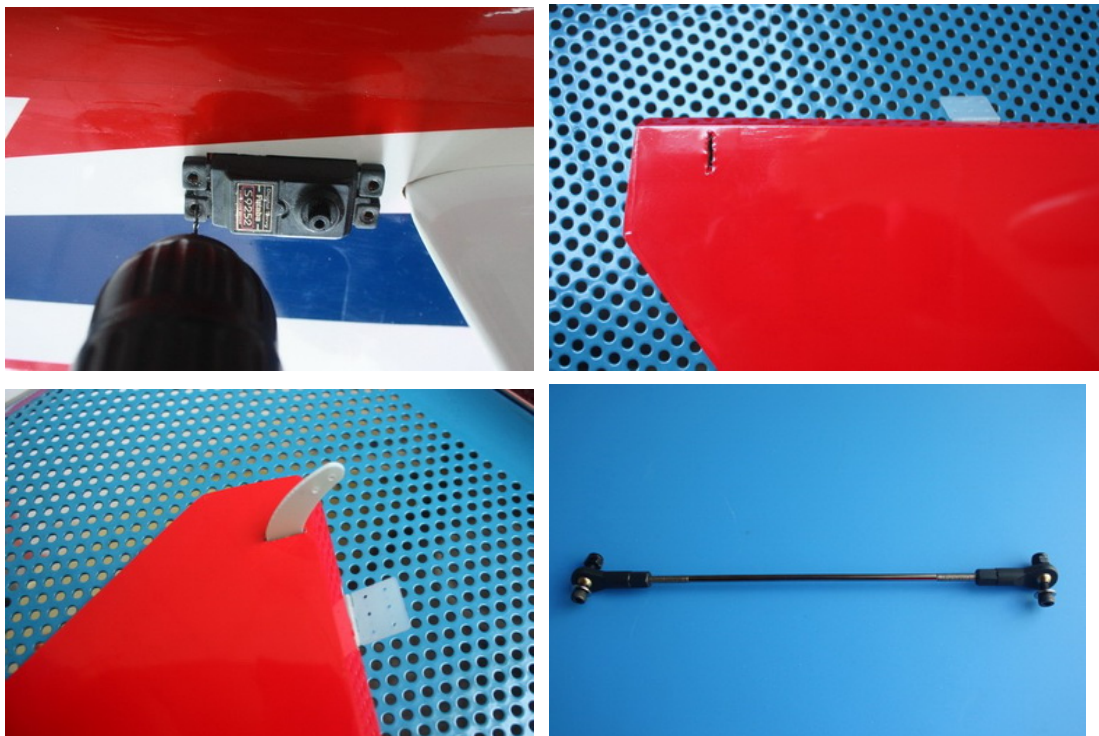


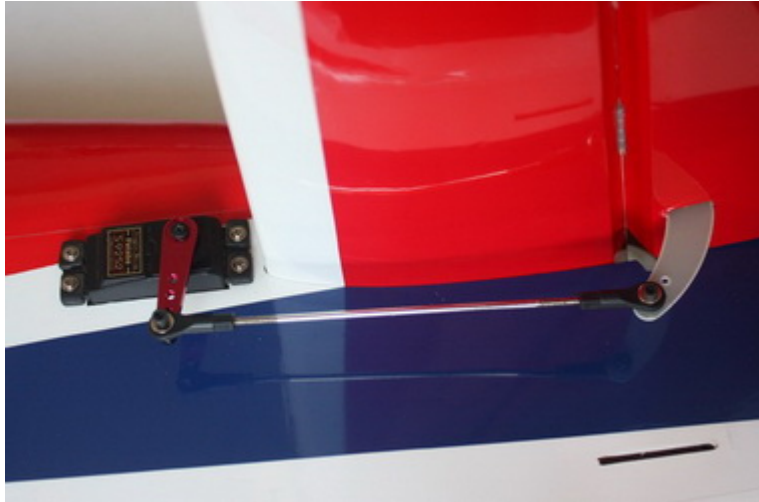
2, Glue the hinge for the elevator the same way as the main wings.



3. Install the horns the same way as the horns on the aileron. Use your radio to set the servo center position and install the large control horn onto the servo. Assemble the control rod and ball links and adjust the control linkage for proper geometry. When satisfied, screw the ball link to the servo arm. The servo arm should be as close to perpendicular to the control rod as possible while the elevator is at neutral. Double check all screws, bolts and nuts to assure proper installation and operation without binding.

(Below long ALU arm is not included)





4. To install the horizontal stabilizers you first need to install two 12" servo wire extensions in the fuselage so that they extend from the radio compartment to the aft openings.

5. There is an option to use one servo or two servos for the elevator. If using one servo, the 2 parts of the elevator need to be connected by the wood block with glue as shown below. The picture is for illustration only. Actually, the connection of the 2 parts needs to be performed in the fuselage after the hinges are connected.



Tail Wheel Installation



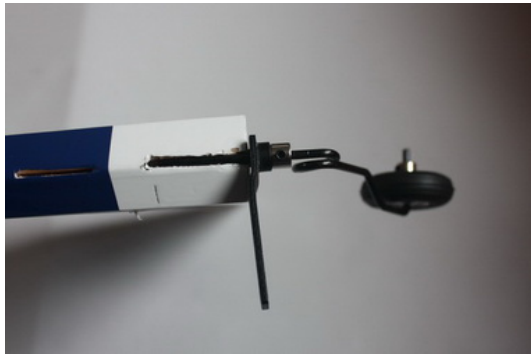
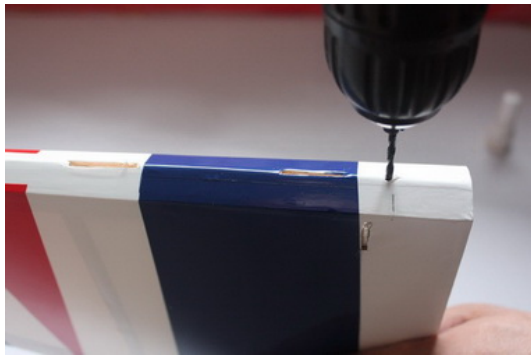
1. Start tail wheel assembly installation. Mount the 1.25in tail wheel on the tail landing gear and fixed with wheel collar, to use thread locker before tightening.



2. Then insert another wheel collar in to other end of the tail landing gear, and insert the tail gear holding plate. Bend the tail wheel wire direction 90 degrees to the tail wheel.



3. According to the above tail wheel wire bending length, drill 2mm hole in th rudder, cut the skin, use 30 minute epoxy to the tail wheel wire rack on the rudder.



4. Drill three 1.5mm holes in the bottom of the fuselage, using three self-tapping screws to attach the tail wheel holding plate fixed to the fuselage.

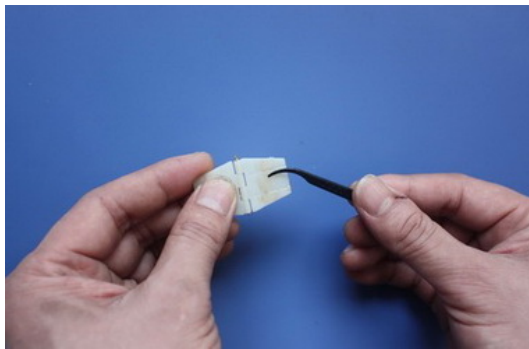
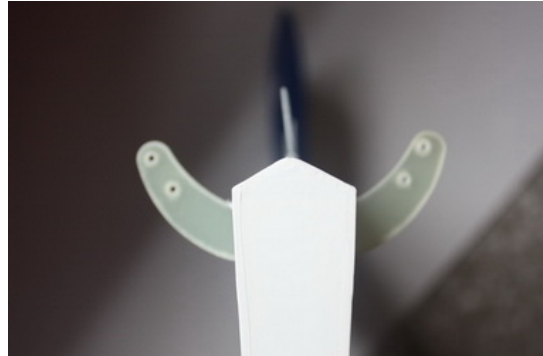
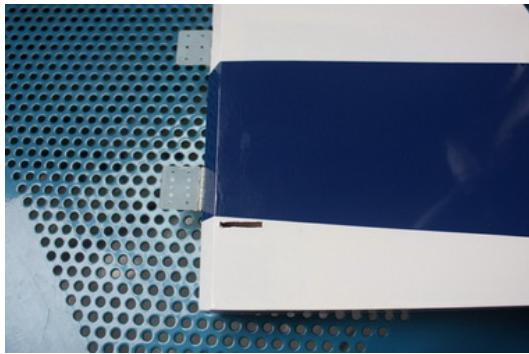


5. The following photo is the tail wheel assembly installed after.



Rudder Assembly

1. Install the fiberglass control horns in the same way as you did the elevator horns.



2. The SBACH is supplied with a high quality set of pull-pull cables and ball-links.



3. Locate the pull-pull cable set, threaded couplers, brass swaging tubes, and ball-links. If the cable is one long piece, cut it into two equal length pieces. Thread one end of the one cable through a brass tube and then through one of the threaded couplers. Run the cable back through the brass tube and then loop it back through a second time. Using a set of crimping pliers, place three crimps just tight enough not

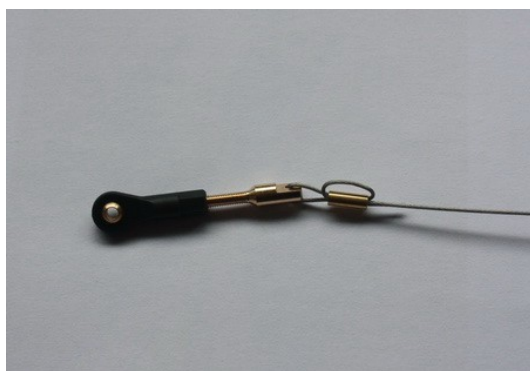
to cut the brass tube but enough to securely hold the wire in place. Cut off the excess cable with wire cutters. Wick thin CA into the brass tube to help hold the cable secure. Repeat for the other cable.

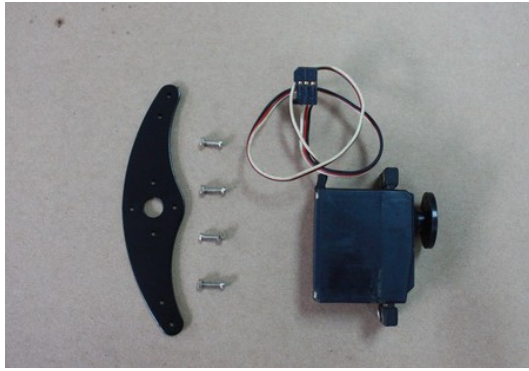
4. Thread the couplers about half way into the ball links of the rudder. Hint: remove the ball links from the rudder horn first to make this step easier and then re-install once the couplers are threaded on. Feed the loose end of each cable into the cable slots at the rear of the fuselage and feed them forward towards the servo mount location. A coat hanger with a hook on the end can be useful here if you can't reach the cable.

4. Use your radio system to center the rudder servo and attach either the supplied arm or an appropriate arm for your servo. Thread one of the ball links about half way onto one of the threaded couplers. Feed the loose end of one of the cables through a brass tube and then through the threaded coupler. Holding the rudder centered, adjust the cable length as tight as possible while checking the ball link position over the servo arm. When satisfied with the position, pinch the cable around the threaded coupler and then feed the loose end back through the brass tube. Loop the cable back through the brass tube as before and crimp the brass tube three times just tight enough not to cut the brass tube but enough to securely hold the wire in place. Cut off the excess cable with wire cutters. Wick thin CA into the brass tube to help hold the cable secure. Repeat for the other cable. Hint: Once you have established the position of the threaded coupler on the cable, you can remove the ball link from the rudder horn to give you more working slack in the fuselage. Re-install the ball link prior to setting the other cable.

6. Check the operation of the rudder using your radio and make sure there is no binding and the cables are adjusted properly. You may have to tighten the cables after a few flights as they may stretch slightly from the initial installation.

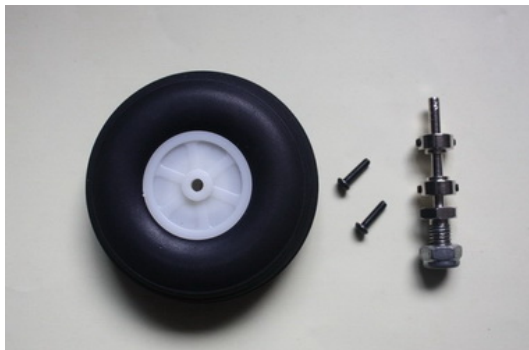
(Below long ALU arm is not included)





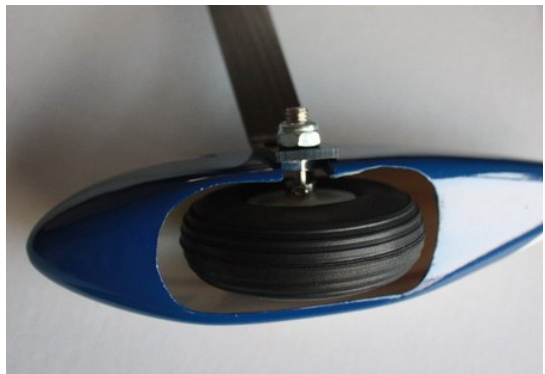
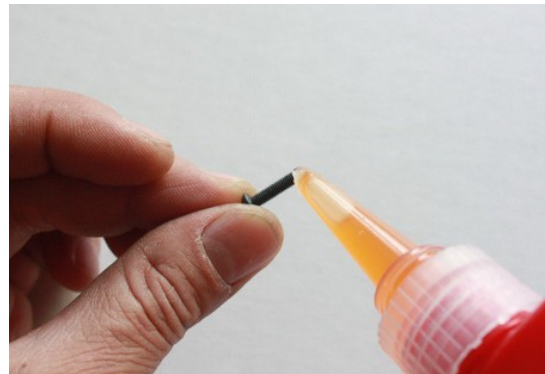
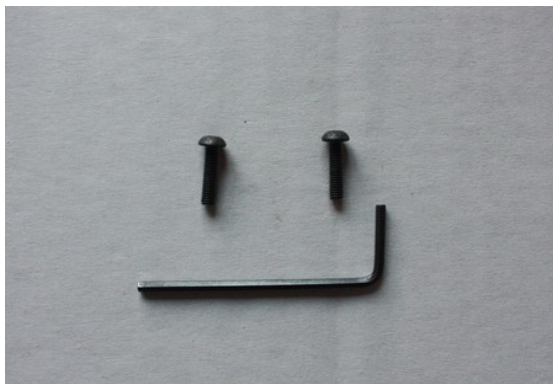
Main Landing Gear Installation

1. Install the wheel axles to the landing gear and tighten the nylon-insert lock nut. Install one wheel collar onto the axle. Use a second wheel collar as a guide to leave a gap on the inboard of the axle. Use a small drop of thread-lock and tighten in place. Slide the wheel onto the axle and install a second wheel collar also using thread-lock on the set screw.





2. Fit the wheel pant in place and install using the two supplied screws. Use thread-lock to secure the screws in place. Repeat the above steps for the other main gear.

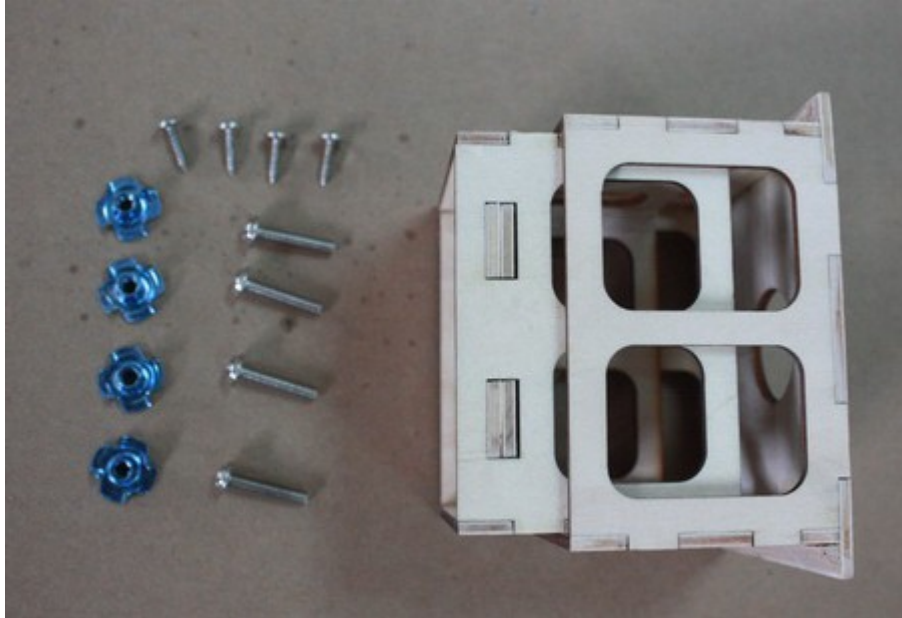


3. Bolt the main gear to the bottom of the fuselage using the supplied bolts.

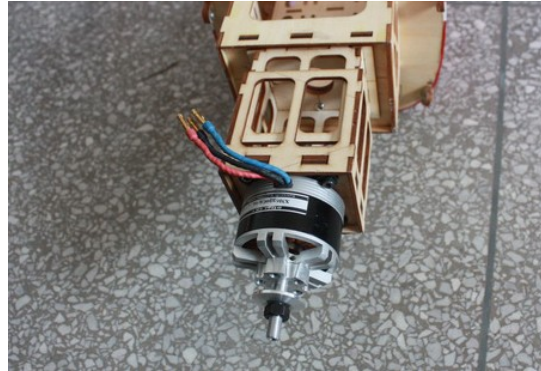
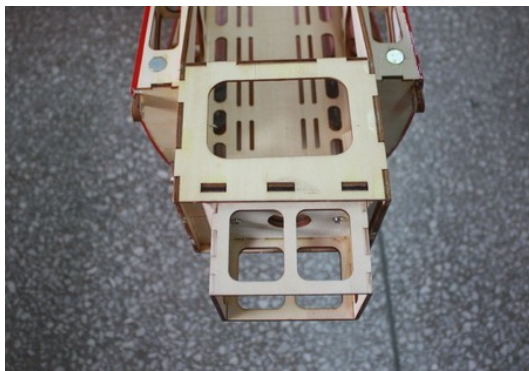


Motor Installation

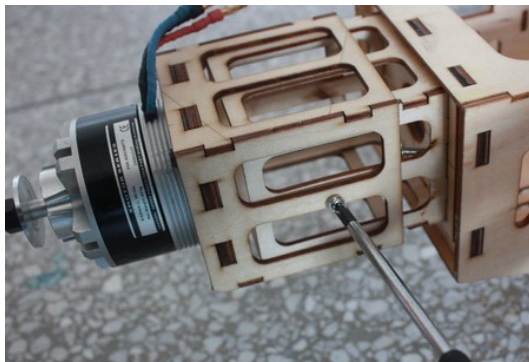
1. This Sbach 300 is designed for brushless motor. It can also be flired with nitro and gas engine.
2. If you use brushless motor, there is an adjustable motor mount in the package.

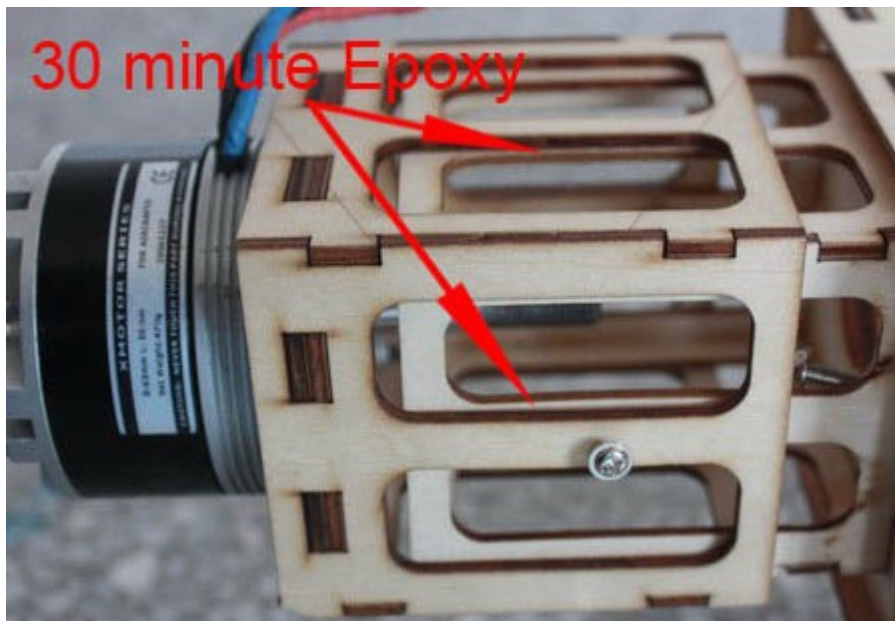


3. First install the motor mount on the firewall. Then install the motor. Adjust the motor mount to fit the cowl.

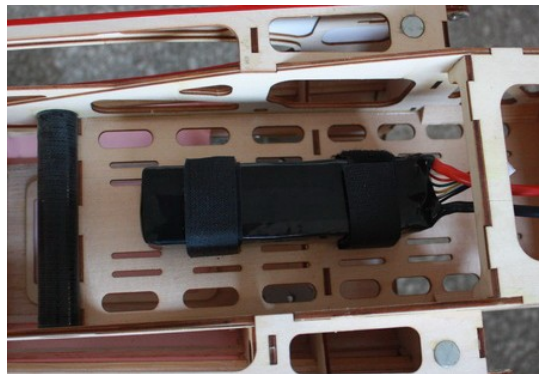


4. After adjusting the motor mount to the right position, lock the 4 screws, unscrew them, apply 30-minute epoxy, and tighten the screws to the previously-found position.



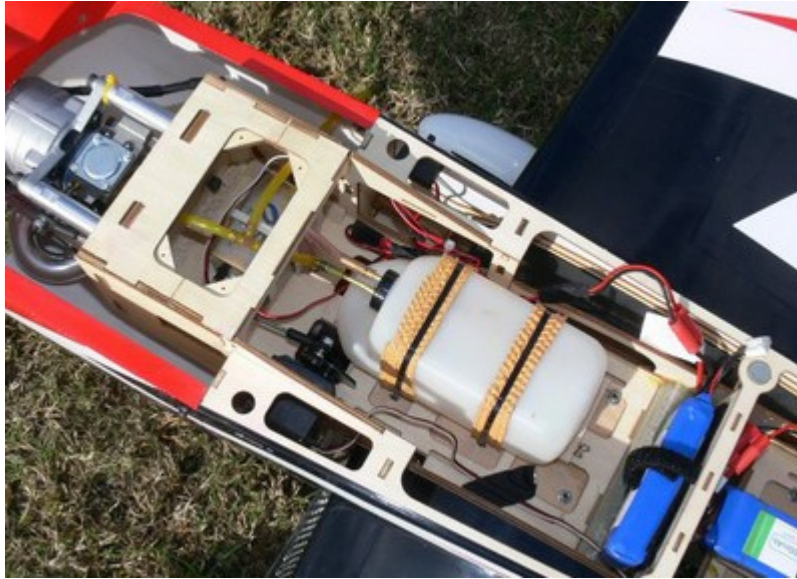


5, Fix the battery with Velcro.



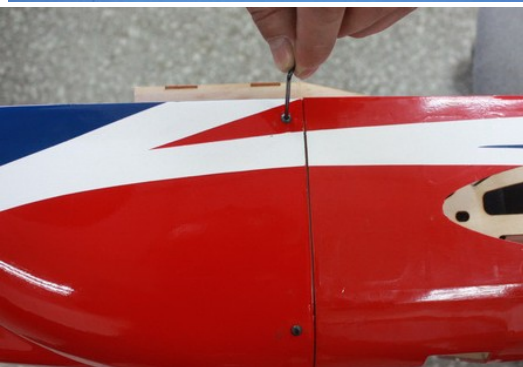
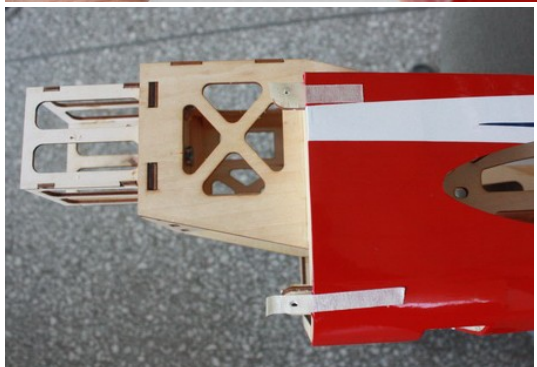
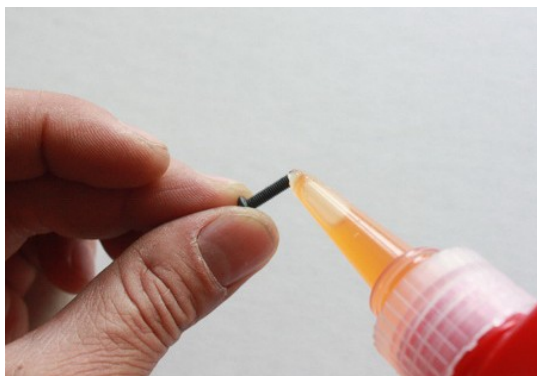
6. The following pictures show how to install gas engine.





Cowling Installation

2. Use tape to mark the positions to drill holes for screws on the cowling. Drill the holes with 3mm drill. Use the 4 3x12mm Hexagon socket screws & washers to secure the cowling. Use a small drop of thread-lock to secure the cap head screws in place.



FINAL RADIO SYSTEM INSTALLATION

1. Whether you 72 MHz systems or the newer 2.4 GHz systems, proper radio installation and care is vital to the safe and reliable operation of your aircraft. Follow the manufacturer's instruction for installation guidance of receivers and batteries paying attention to factors such as vibration isolation, adequate cooling, and clearances.
2. Mount your receiver(s) securely in a location which provides a clean and maintenance free solution to your setup. All servo wires should be neatly routed and secured in place so they will not come loose or flop around during flight.
3. The fuselage ply sides provide space to mount your switches just below the canopy. Mount your switches according to the manufacturer's instructions and route your wires safely and securely as above.
4. Your receiver battery(s) can be mounted in a variety of locations depending on your balance needs. Regardless of where you mount your batteries it is vital that they are very secure with no possibility of coming loose. Use double sided velcro to hold the batteries from sliding around and then use zip ties or velcro straps to secure them tightly in place.
5. Servo and battery leads are the life blood of your aircraft. Make sure all wires are top quality and connectors are tight and display no loose pins or frayed wires. Servo clips are provided in the kit for your convenience. These servo clips can even be glued to the wood structure using CA if desired.
6. Check all radio programming and control surface operations thoroughly before your initial flight. Check your radio range according to the radio manufacturer's instructions both with the engine off and running.

BALANCING and PRE-FLIGHT

1. Most state of the art aerobatic aircraft allow for a wide margin for balancing depending on what level of precision or freestyle the pilot prefers. To perform properly without being too pitch sensitive, you must not go too aft on the CG. **We recommends an initial CG setting of 4.2 – 5 inches (107-127mm) behind the leading edge of the wing at the root.** More experienced pilots may want to set the CG further aft for more 3D capability. Varying weights of engines and radio gear will dictate how you should install each. The batteries can easily be located pretty much anywhere in the fuselage.

Note: The best way to check your balance is to trim for level flight at about 1/2 to 3/4 throttle and then roll inverted. The aircraft should maintain level flight with very little to no down elevator input. If the aircraft climbs when inverted then you've probably got your CG too far aft. If the nose drops more than slightly, then you are most likely nose heavy.

Recommended control surface deflections:

	Low Rate	High Rate
Elevator	15 degrees	45-50 degrees
Rudder	25 degrees	40-45 degrees
Ailerons	25 degrees	35-40 degrees

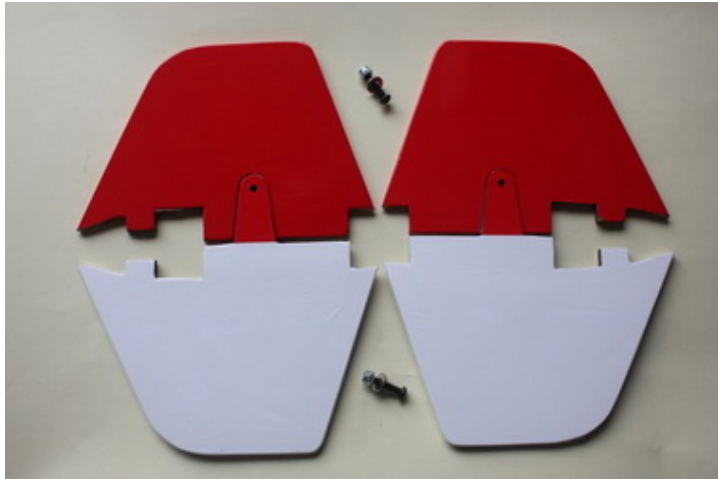
FINAL ASSEMBLY AND PRE-FLIGHT INSPECTIONS

1. Before arriving at your flying field, be sure all your batteries are properly charged and all radio systems are in proper working order.
2. Install the wings onto the fuselage being careful to align the wing tube with the wings and not force it. The wing tube may be initially tight but will loosen some with use. Guide your servo wires into the fuselage openings and connect to the proper aileron channels. Servo clips are recommended. Once you have the wings fully seated in the fuselage tighten the wing bolts inside the fuselage.



3. Side force generators Assembly.

Cut the wing film needed to be instal the SFG. Fixed the SFG Use M3X12 Hexagon socket screw & washer & Self-locking nut.



4. Fill your fuel tank making sure your vent line is not plugged or capped. With the canopy off, this is a good time to check for any fuel leaks.
5. Position the canopy in place and tighten the canopy screws. Be sure to use the supplied rubber washers under the screw heads.
6. If you have removed your horizontal stabilizers, install them once again and check all bolts and connections.
7. Check all control surfaces for secure hinges by performed a slight tug on the control surfaces and observing if there is any give in the hinges. Check all control rods, ball links, servo screws, etc. for proper operation and installation.
8. Check your batteries and perform a proper range check once again with the engine off and running. Be sure all surfaces are moving in the correct direction and the proper amount for your flying setup.

Wingbag for 20CC (Not Included)





3in C.F Spinner with Alu base (for electric) Not Included





3in C.F spinner for Nitro&Gas (Not Included)





ARF
WWW.ARFMFG.COM