

Futaba®

Sky Leaf **Leader**

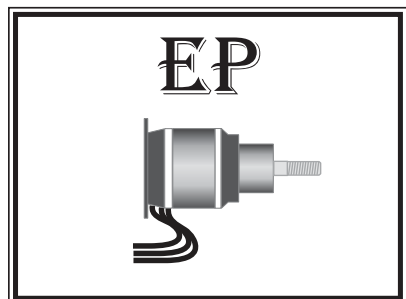
R/C model For F3A competition Biplane

For expert flyers

EP: F3A motor

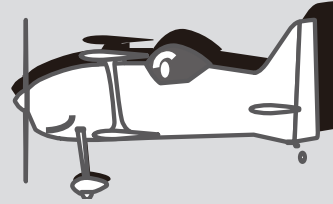


Instruction Manual



Thank you for purchasing Futaba Sky Leaf R/C airplane.

To maximize your enjoyment, and to ensure proper flying, please read through this assembly instruction manual.



This product is for F3A competition. It can not be assembled or flighted by a beginner. It can be manufactured only for flyers with special skills.

Futaba guarantees this kit to be free from defects in both material and workmanship at date of purchase. This warranty does not cover any component parts damaged by use or modification. In no case shall Futaba liability exceed the original cost of the purchased kit. Further, Futaba reserves the right to change or modify this warranty without notice.

In that Futaba has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability. If the buyer is not prepared to accept the liability associated with the product, the buyer is advised to return this kit immediately in new and unused condition to the place of purchase.

Precautions

Application and modification precautions.

- 1. This product is only designed for use with radio control models. Use of the product described in this instruction manual is limited to radio control models.*
- 2. Modification, adjustment, and parts replacement:
Futaba is not responsible for unauthorized modification, adjustment, or replacement of parts on this product.*
- 3. Your Sky Leaf should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, this airplane, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.*
- 4. You must assemble the model according to the instructions. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the figures. In those instances the written instructions should be considered as correct.*
- 5. You must take time to build straight, true and strong.*
- 6. You must use an R/C radio system that is in good condition, a correctly sized motor, and other components as specified in this instruction manual. All components must be correctly installed so that the model operates correctly on the ground and in the air. You must check the operation of the model and all components before every flight.*

- No part of this manual may be reproduced in any form without prior permission.
- The contents of this manual are subject to change without prior notice.
- Futaba is not responsible for the use of this product by the customer.
- Company and product names in this manual are trademarks or registered trademarks of the respective company.

For safe use

Please observe the following precautions to ensure safe use of this product at all times.

Meaning of Special Markings:

The parts of this manual indicated by the following marks require special attention from the standpoint of safety.

- ⚠ DANGER** - Procedures which may lead to dangerous conditions and cause death/serious injury if not carried out properly.
- ⚠ WARNING** - Procedures which may lead to a dangerous condition or cause death or serious injury to the user if not carried out properly, or procedures where the probability of superficial injury or physical damage is high.
- ⚠ CAUTION** - Procedures where the possibility of serious injury to the user is small, but there is a danger of injury, or physical damage, if not carried out properly.

⊘ = Prohibited

❗ = Mandatory

WARNING: Always keep R/C components away from small children.

Assembly precautions

⚠ DANGER

❗ We, as the manufacturer, provide you with a good quality, thoroughly tested kit and instructions, but ultimately the quality and flyability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed airplane, and no representations are expressed or implied as to the performance or safety of your completed airplane.

❗ Take your time and follow the instructions to end up with a well-built model that is straight and true.

❗ First-time builders should seek the advice of experienced modellers before beginning assembly and if they do not fully understand any part of the construction.

❗ Installing a more powerful motor than specified or flying the hi-speed aggressively may lead to serious damage and accidents.

❗ Make the assembly correct with this manual.

■ If the assembly manual is not followed, in flight failure or danger to model and property could occur.

⊘ Do not fly before confirming the correct location of the C.G.

■ If the CG is incorrect, the model will be difficult to fly and could lead to a crash.

❗ Since the direction of the servos of an airplane can be easily mistaken, be very careful.

■ Double check that all directions are correct.

⊘ Do not use an overpowered motor or too large of propeller on this airframe.

■ When not equipped properly, the performance might not be as described by the manufacturer.

❗ Make sure that all surfaces are level before flying.

■ If the surfaces are not level, the airplane will not fly straight and will be hard to control.

❗ Assemble this airplane only in places out of children's reach.

■ A small child may accidentally operate the system. This could cause a dangerous situation and injuries. Each part can be very dangerous when mishandled and cause chemical damage.

⊘ Use glues and adhesives that are needed for assembly in a well ventilated area.

■ Poor ventilation could lead to toxic fumes being inhaled.

Storage and disposal precautions

⚠ CAUTION

⊘ Do not store devices in the following places:

- Where it is extremely hot (30°C [86F] or higher) or cold (0°C [32F] or lower)
- Where the equipment will be exposed to direct sunlight
- Where the humidity is high
- Where vibration is prevalent
- Where it is very dusty
- Where the device may be exposed to steam and heat

❗ When the device will not be used for a long time, remove the battery from the transmitter and aircraft and store them in a dry place where the temperature is between 0 and 30°C [32F and 86F].

■ Leaving batteries inside your model and radio when they are not being used for long periods will result in battery deterioration, liquid leakage and other damage.

Other precautions

⚠ CAUTION

⊘ Do not directly expose model to fuel, oil, exhaust gas, etc.

■ If left in such an environment, the model may be attacked and damaged.

⊘ Do not add any extra devices that are not suggested by the factory on the airplane.

■ If the airplane is changed too much, the manufacture cannot promise correct performance.

❗ Join the Academy of Model Aeronautics.

■ The Academy of Model Aeronautics (AMA) provides guidelines and liability protection should the need arise.

❗ Always use genuine Futaba products such as transmitter, receiver, servo, etc.

■ Futaba is not responsible for damage sustained by combination with other than Futaba Genuine Parts. Use the parts specified in the instruction manual and catalog.

Flying precautions

⚠ DANGER

❗ Take enough safety precautions prior to operating this model. You are responsible for this model's assembly and safe operation.

❗ First-time fliers should seek advice for hints in pre-flight adjustments and assembly from experienced fliers. Be reminded that flying a badly assembled or badly adjusted airplane is very dangerous.

❗ In the beginning, first-time fliers should always be assisted by an experienced flier and never fly alone.

❗ Before flying your airplane, ensure the airfield is spacious enough. Always fly it outdoors in safe areas with no debris or obstacles.

❗ Ensure the propeller are securely installed.

⊘ Do not fly your airplane on days with strong winds or side winds.

⊘ Do not allow a bystander to get too close to the propeller.

❗ Do not use defective propellers.

⊘ Never grasp the transmitter antenna while flying.

■ The transmitter output may drop drastically.

❗ Always make sure that all transmitter stick movements operate all servos properly in the model prior to flight. Also, make sure that all switches, etc. function properly as well. If there are any difficulties, do not use the system until all inputs are functioning properly.

❗ While operating, never touch the transmitter with, or bring the transmitter near, another transmitter, a cell phone, or other wireless devices.

■ Doing so may cause erroneous operation.

⊘ Do not point the antenna directly toward the aircraft during flight.

■ The antenna is directional and the transmitter output is weakest. (The strength of the radio waves is greatest from the sides of the antenna.)

⊘ Never fly on a rainy day, when the wind is strong, and at night.

■ Water could lead to failure or improper functionality and poor control of the aircraft which could lead to a crash.

⊘ Never turn the power switch on and off during flight or while the motor is running.

■ Operation will become impossible and the aircraft will crash. Even if the power switch is turned on, operation will not begin until transmitter and receiver internal processing is complete.

⊘ Do not fly when you are physically impaired as it could pose a safety hazard to yourself or others.

⊘ Do not fly at the following places:

- Near another radio control flying field.
- Near or above people.
- Near homes, schools, hospitals airports, roads or other places where people congregate.
- Near high voltage lines, high structures, or communication facilities.

❗ When setting the transmitter on the ground during flight preparations, do not stand it upright.

■ The transmitter may tip over, the sticks may move and the propeller may rotate unexpectedly and cause injury.

⊘ Do not touch the motor, motor controller, during and immediately after use.

■ These items may become hot during use.

❗ For safety, fly so that the aircraft is visible at all times.

■ Flying behind buildings or other large structures will not only cause you to lose sight of the aircraft, but also degrade the RF link performance and cause loss of control.

❗ From the standpoint of safety, always set the fail safe function.

■ In particular, normally set the throttle channel to idle.

❗ When flying, always return the transmitter setup screen to the Home screen.

■ Erroneous input during flight is extremely dangerous.

❗ Always check the remaining capacity of the transmitter and receiver batteries before each flying session prior to flight.

■ Low battery capacity will cause loss of control and a crash.

❗ Always check operation of each control surface and perform a range test before each flying session.

■ Even one transmitter setting or aircraft abnormality can cause a crash.

❗ Before turning on the transmitter:

1. Always move the transmitter throttle stick position to the minimum (idle) position.
2. Turn on the transmitter first and then the receiver.

❗ When turning off the transmitter's power switch after the motor/engine has stopped (state in which it will not rotate again):

1. Turn off the receiver power switch.
2. Then turn off the transmitter power switch.

■ If the power switch is turned on/off in the opposite order, the propeller may rotate unexpectedly and cause a serious injury.

■ Also always observe the above order when setting the fail safe function.

■ Maximum low throttle: Direction in which the motor runs at the slowest speed or stops.

❗ When adjusting the transmitter, stop the motor, disconnect the motor wiring that allows it to continue operation. When doing so, please exercise extreme caution. Ensure that the aircraft is secured and that it will not come into contact with anything or anyone. Ensure that the motor will not rotate prior to making any adjustments.

■ Unexpected high speed rotation of the motor may cause a serious injury.

⊘ This airframe is not designed to fly at excessively high speeds.

■ The airplane could become damaged.

Battery and charger handling precautions

⚠ DANGER

⊘ **Do not recharge a battery that is damaged, deteriorated, leaking electrolyte, or wet.**

⊘ **Do not allow the charger or battery to become wet.**

■ Do not use the charger when it or your hands are wet. Do not use the charger in humid places.

⊘ **Do not short circuit the battery.**

⊘ **Do not repair, deform, modify, or disassemble the battery and/or battery charger.**

⊘ **Do not drop the battery into a fire or bring it near a fire.**

⊘ **Do not charge and store the battery in direct sunlight or other hot places.**

⊘ **Do not charge the battery if it is covered with any object as it may become very hot.**

⊘ **Do not use the battery in a combustible environment.**

■ The gas could ignite and cause an explosion or fire.

❗ **Always charge the battery before each flying session.**

■ If the battery goes dead during flight, the aircraft will crash.

■ Charging the battery past the specified value may cause a fire, combustion, rupture, or liquid leakage.

■ Do not charge the battery while riding in a vehicle. Vibration will prevent normal charging.

⊘ **When using the Lithium battery, do not connect the charger to the balance charge connector and the power connector at the same time.**

■ Doing so could cause a fire, combustion, generation of heat, rupture, or liquid leakage.

❗ **Insert the power cord plug firmly into the receptacle up to its base.**

❗ **Always use the charger with the specified power supply voltage.**

■ Use the special charger by connecting it to a proper power outlet.

❗ **If the battery liquid should get in your eyes, do not rub your eyes, but immediately wash them with tap water or other clean water and get treated by a doctor.**

■ The liquid can cause blindness.

⚠ WARNING

⊘ **Do not touch the charger and battery for any length of time during charging.**

■ Doing so may result in burns.

⊘ **Do not use a charger or battery that has been damaged.**

⊘ **Do not touch any of the internal components of the charger.**

■ Doing so may cause electric shock or a burn.

⊘ **If any abnormalities such as smoke or discoloration are noted with either the charger or the battery, remove the battery from the transmitter or charger and disconnect the power cord plug and do not use the charger.**

■ Continued use may cause fire, combustion, generation of heat, or rupture.

⊘ **Do not subject the batteries to impact.**

■ Doing so may cause fire, combustion, generation of heat, rupture, or liquid leakage.

❗ **Use and store the battery and battery charger in a secure location away from children.**

■ Not doing so may cause electric shock or injury.

❗ **If the battery leaks liquid or generates an abnormal odor, immediately move it to a safe place for disposal.**

■ Not doing so may cause combustion.

❗ **If the battery liquid gets on your skin or clothing, immediately flush the area with tap water or other clean water.**

■ Consult a doctor. The liquid can cause skin damage.

❗ **After the specified charging time has elapsed, end charging and disconnect the charger from the receptacle.**

❗ **When recycling or disposing of the battery, isolate the terminals by covering them with tape.**

■ Short circuit of the terminals may cause combustion, generation of heat or rupture.

⚠ CAUTION

⊘ **Do not place heavy objects on top of the battery or charger. Also, do not place the battery or charger in any location where it could fall.**

■ Doing so may cause damage or injury.

⊘ **Do not store or use the battery and charger where it is dusty or humid.**

■ Insert the power cord plug into the receptacle only after eliminating the dust.

⊘ **After the aircraft/transmitter has been used for a long time, the battery may become hot. Immediately remove it from the aircraft/transmitter.**

■ Not doing so may cause a burn.

⊘ **Do not charge the battery in extreme temperatures.**

■ Doing so will degrade the battery performance. An ambient temperature of 10°C to 30°C (50°F to 86°F) is ideal for charging.

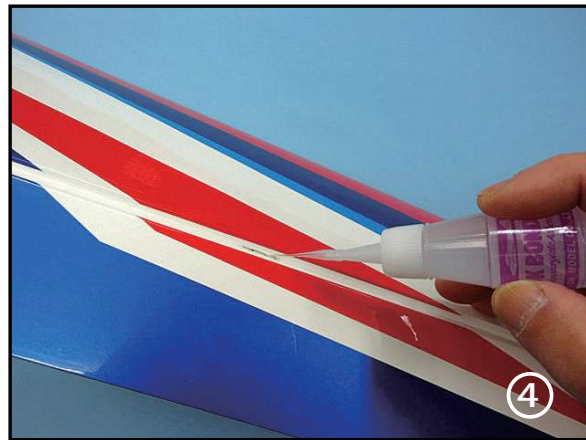
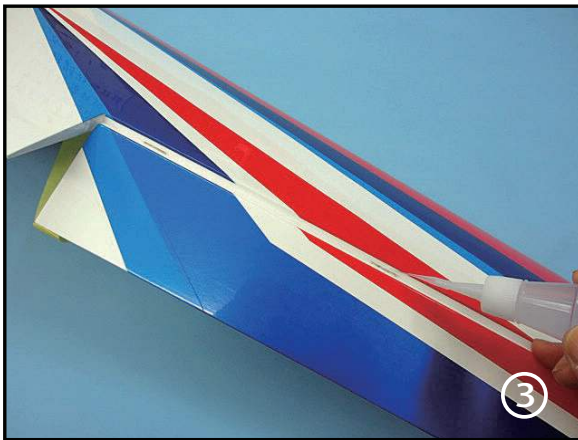
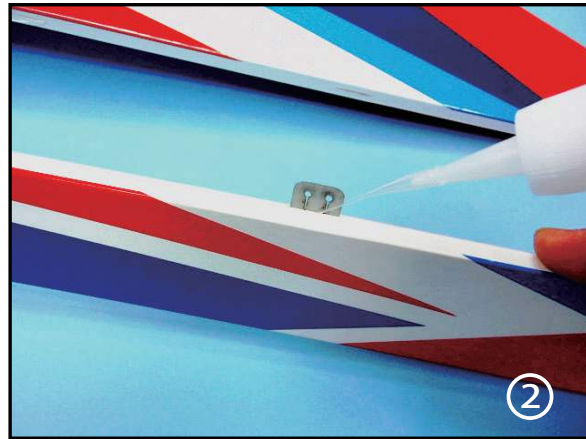
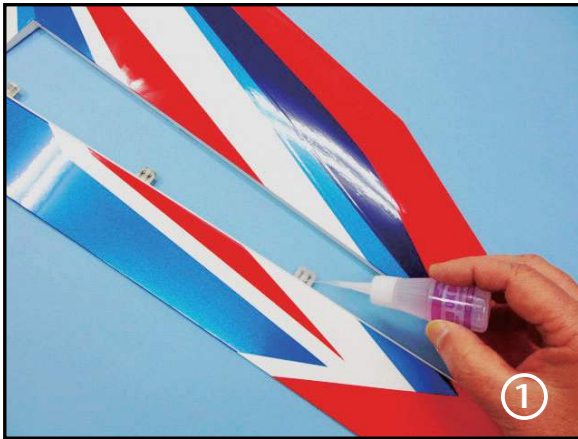
⊘ **Unplug the charger when not in use.**

⊘ **Do not bend or pull the cord unreasonably and do not place heavy objects on the cord.**

■ The power cord may be damaged and cause combustion, generation of heat, or electric shock.

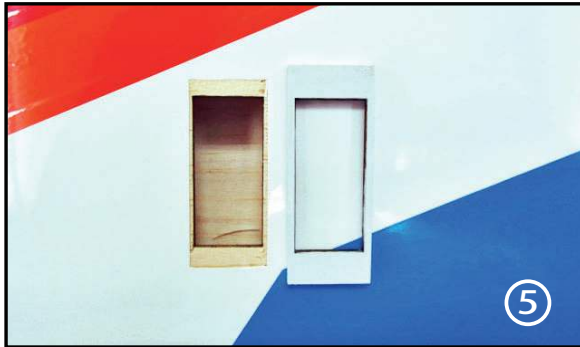
Installation of aileron, elevator, rudder, hinge

- The explanation is showing the aileron as an example, but attach the elevator and rudder hinge in the same way.
- Insert half the hinge into the aileron and adhere the CA glue. After drying, insert the aileron into the main wing and pour the CA glue into the hinge. There should be no clearance between the main wing and the ailerons.
- After drying, check that the aileron moves smoothly.



Installation of aileron servo mount

- Cut the film of the aileron servo mounting hole of the main wing. Remove the aileron servo mounting base from the included pre-cut 3 mm wood plate and paint the color according to your preference. In the sample it is painted white. Trace the servo mount onto the film using a thin marker. Strip out the film 1 mm inward and remove it. Adhere the servo mount with CA glue.



Installation of aileron servo. Aileron linkage

Recommendation: BLS173SVi \times 4, EXT code 200 mm \times 4, S.BUS HUB 120 - 70 \times 2

Cut the film at the exit of the servo wire in the center of the main wing. Pass the servo wire inside the main wing. It is also a good method to guide with a weighted string.

Attach the aileron servo to the mount with a tapping screw.

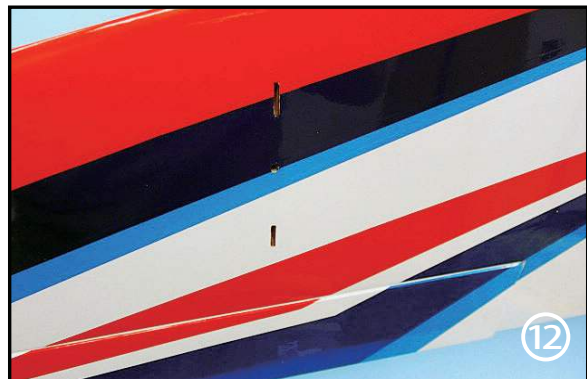
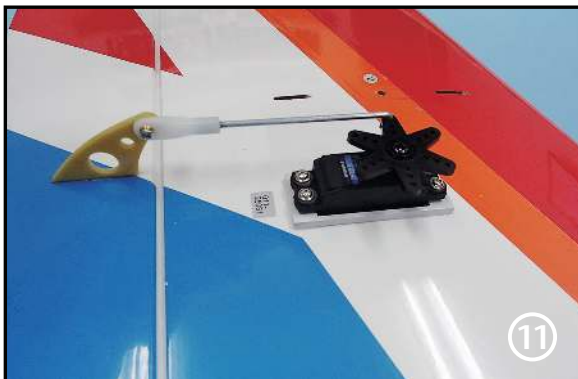
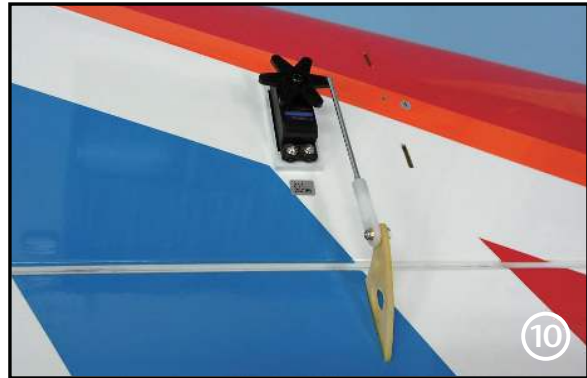
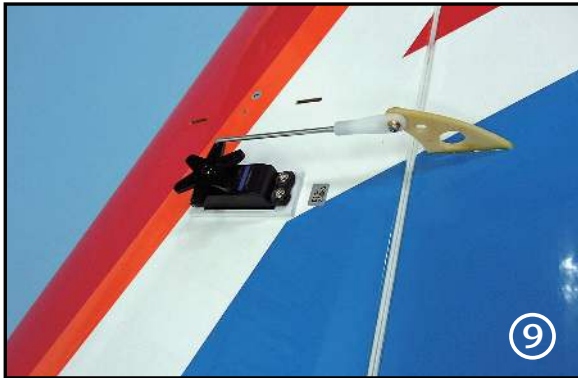
Attach the control horn to the ailerons.

Using the guide -**#7 (photo)**, first make a hole with a 2 mm drill and then create a mounting hole for the control horn. To determine the position of the control horn with reference to **#8**.

Make the aileron linkage. **#9-#11**

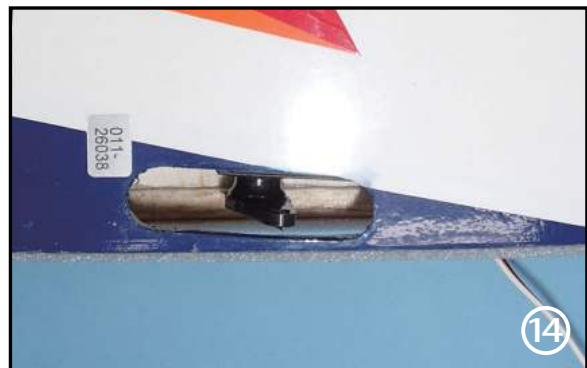
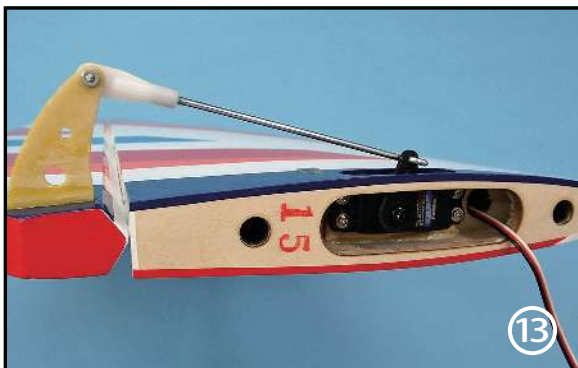
Cut the film of the holes with struts on the main wing.

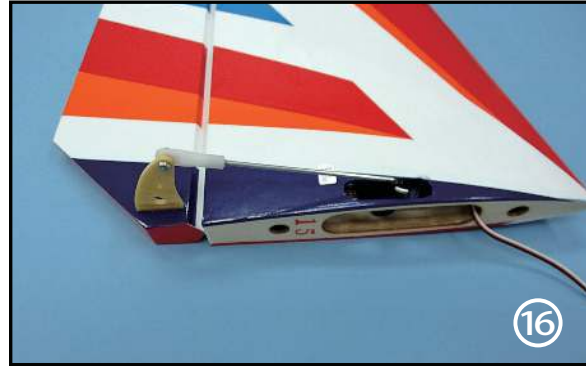




Installation of elevator servo. Elevator linkage

- Recommendation: BLS173SVi × 2
- The servo is mounted inside the horizontal stabilizer. First, connect the servo to the receiver and place it in the neutral position.
- Attach Horn A to the servo, find the arm that is about 15 degrees forward and cut off the other extra arm.
- Remove the servo horn and place the servo on the horizontal stabilizer. While checking the position where the servo horn exits the horizontal stabilizer, open the horn drive hole in the horizontal stabilizer.
- Make the elevator linkage.

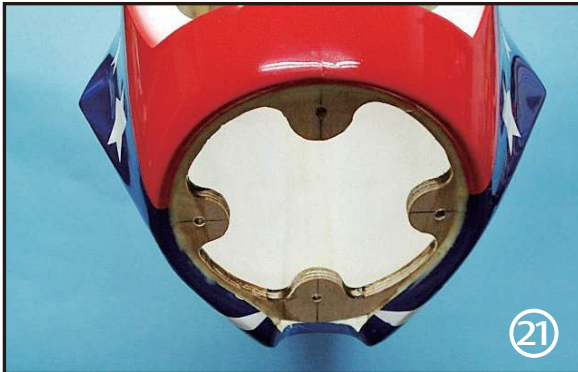
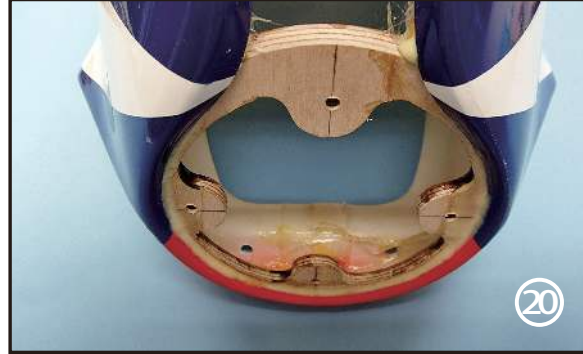
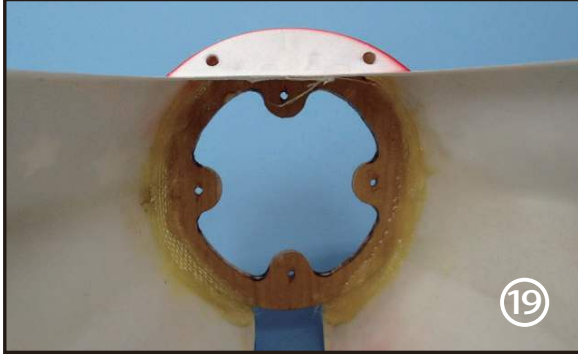




Motor mount

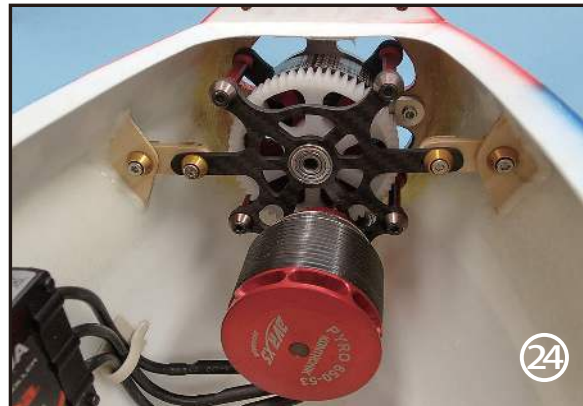
- This manual explains the front mount such as Adverrun Contra unit. O.S. F3A motor (motor reduction).
- Necessary: Wood made (5-6 mm) motor mount (according to the last figure of this manual), Epoxy glue, Micro balloon, Glass cloth.
- Cut the front part of the fuselage like **#18**. The down thrust fits the front of the fuselage. For a normal propeller, make sure the side thrust is at right 3 degrees. In the case of Contra unit, the side thrust is 0 degree. Make sure the clearance between the spinner plate and the front of the fuselage is 3-5 mm. Bond the Wood made (5-6 mm) motor mount (according to the last figure of this manual) to the front. Use micro balloons mixed with epoxy adhesive. After bonding, reinforce the glass cloth with epoxy adhesive.
- Open the M3 screw holes for attaching the motor unit in 4 places. Use the front mount of your motor unit to check the center position and then determine the hole position.





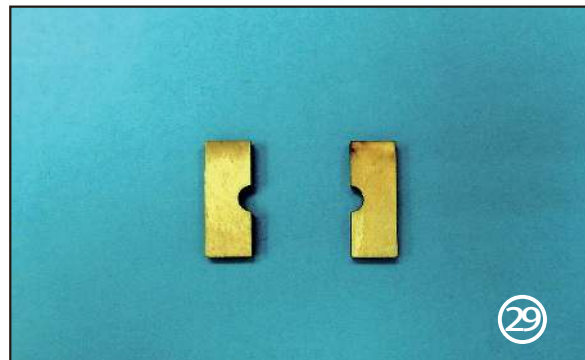
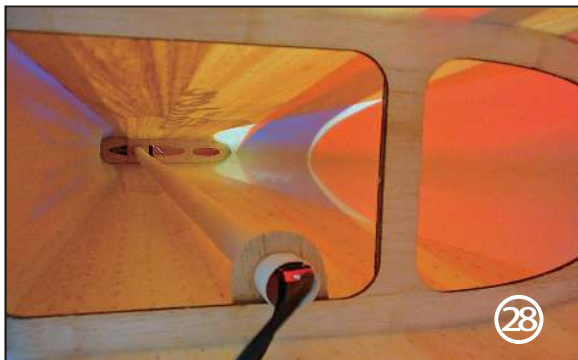
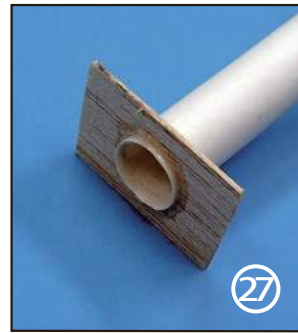
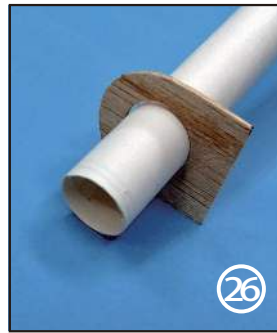
Installation of Motor unit

- This manual explains the front mount such as Adverrun Contra unit.
- Attach the front mount to the motor unit. Then attach it to the fuselage mount with M3 cap bolt. Make sure that the screw and the spinner do not interfere.
- Make a rear mount with 3 mm wood plate. Install it like **#24**.



Installation of rudder servo, Rudder linkage, tail wheel

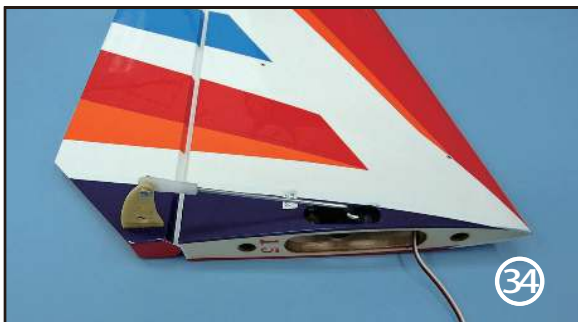
- Recommendation: BLS175SV
- Make a pipe that passes the wiring like **#25**, with paper.
- Make plates like **#26, #27** in balsa wood.
- Install it on the fuselage like **#28** and pass the servo wire.
- Attach the rudder servo mount to the fuselage and mount the rudder servo.
- linkage of the Rudder.
- Use **#31** parts and wear the tailwheel like **#30**.





Installation of horizontal stabilizer

- The horizontal stabilizer is attached to the body with a carbon tube. Bond one of the carbon tubes to the horizontal stabilizer. Fix another horizontal stabilizer with tapping screws.
- Search for the screw hole in **#34** horizontal stabilizer, and make a hole in the film.
- Make sure the carbon tube is in the correct position and then bond the carbon tube to **#35** horizontal stabilizer. **#35** horizontal stabilizer mounted on the fuselage **#34**. Follow the screw holes in the horizontal stabilizer, and screw holes in the carbon tube and fix with tapping. Make sure there is no clearance between the fuselage and the horizontal stabilizer.



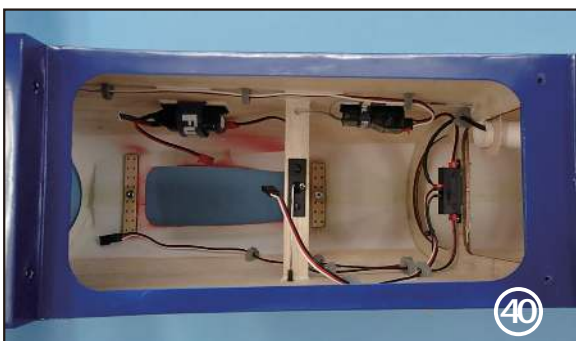
Installation of bottom wing dowel, top wing T-nut

- Attach the dowels to the bottom wing. Then cut two M3 screw holes in the bottom wing. Adhere the reinforcing plate of the screw hole to the bottom wing. Cut the adhesive film beforehand.
- Cut the film in the M3 screw mounting hole of the top wing. Place the top wing on the fuselage and check the position of the T-nut mounting hole. If the position is correct, install T-nut. If holes are misaligned, correct them before installing T - nut.



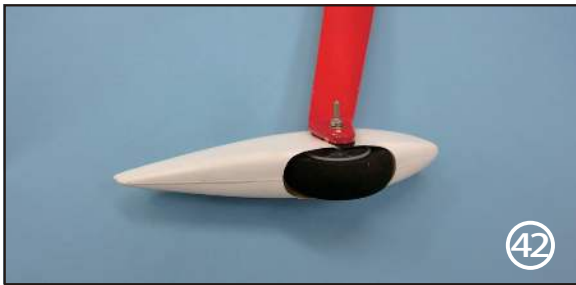
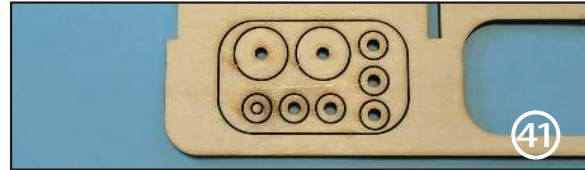
Installation of receiver, ESC, switch

- Install the receiver, ESC, switch as shown in the following picture. Each wire is fixed.



Main gear

- Mount the T-nut on the bottom of the main gear. Drill a small hole with a drill so that the nail bites as the material is hard. Then fix T-nut with epoxy glue.
- Assemble the wheel and the wheel pants. Make sure the wheels are located in the center of the wheel pants with the supplied wood washers.
- Insert the main gear in the fuselage and fix with the M3 screw. Expand it because the gear insertion hole of the fuselage is narrow.
- Pay attention to the lengths of the front and rear screws.



Cooling air vent

- Be sure to open the air vent on the lower side of the rear part of the fuselage for cooling of the motor unit, ESC, etc. There is a guide at the end of this manual, so use it. Adjust the hard balsa wood of about 5 mm x 10 mm x 230 mm for reinforcement inside the center of the outlet after opening.



Installation of Canopy stopper

- Produce the canopy stopper with the attached carbon rod. Reinforce the inner side of the fuselage of the mounting part with balsa wood like #45. Put the carbon rod in the center. Adhere the center. Adhere plastic balls to both ends of the carbon rod.



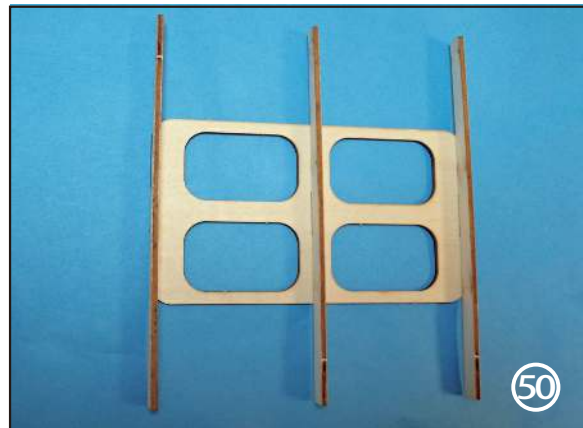
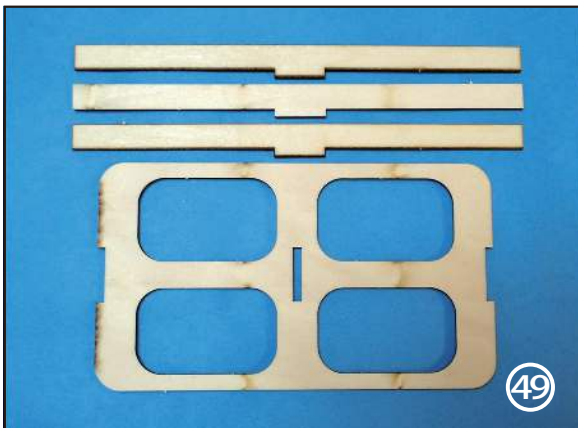
Installation of tail fin

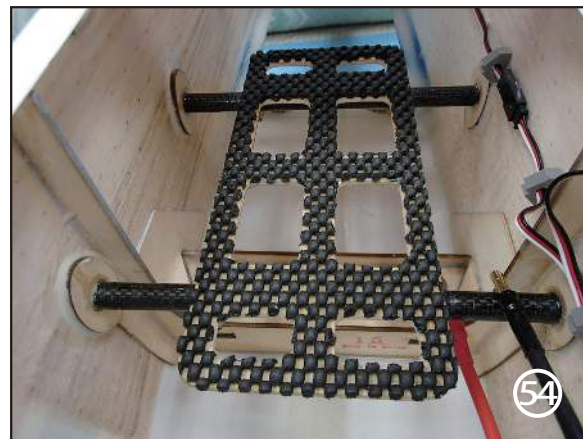
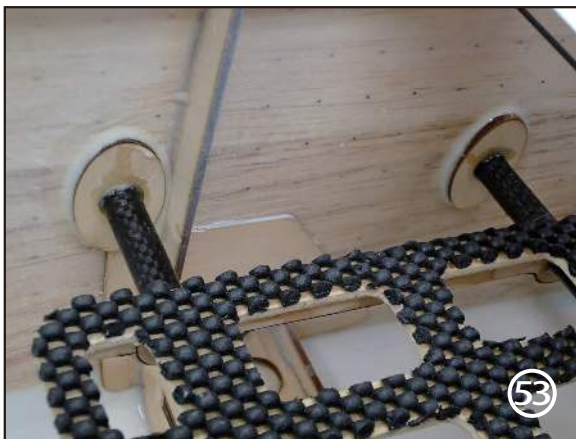
- Adhere the tail fins like **#47** to the tail bottom of the fuselage. Prepare with sandpaper in advance and paint.
- Adhere the fins to the horizontal stabilizer like **#48**. Adhere parallel to the fuselage to the position of 190 mm from the base of the horizontal stabilizer.



Battery mount, CG position

- Assemble the attached battery mount **#50**.
- If the size is insufficient, make it from 3 mm wood board from the last figure of this manual.
Attach to the fuselage with 10 mm carbon tube like **#53-#54**. Expand **#52** wood plates into 10 mm holes.
- After confirming CG with all equipped equipment, adjust the position of battery mount.
- Because heavy batteries are installed, firmly adhere.
- CG is 150-160 mm from the topwing center leading edge.
- First flight makes CG ahead, and afterwards you enjoy the adjustment with taste.



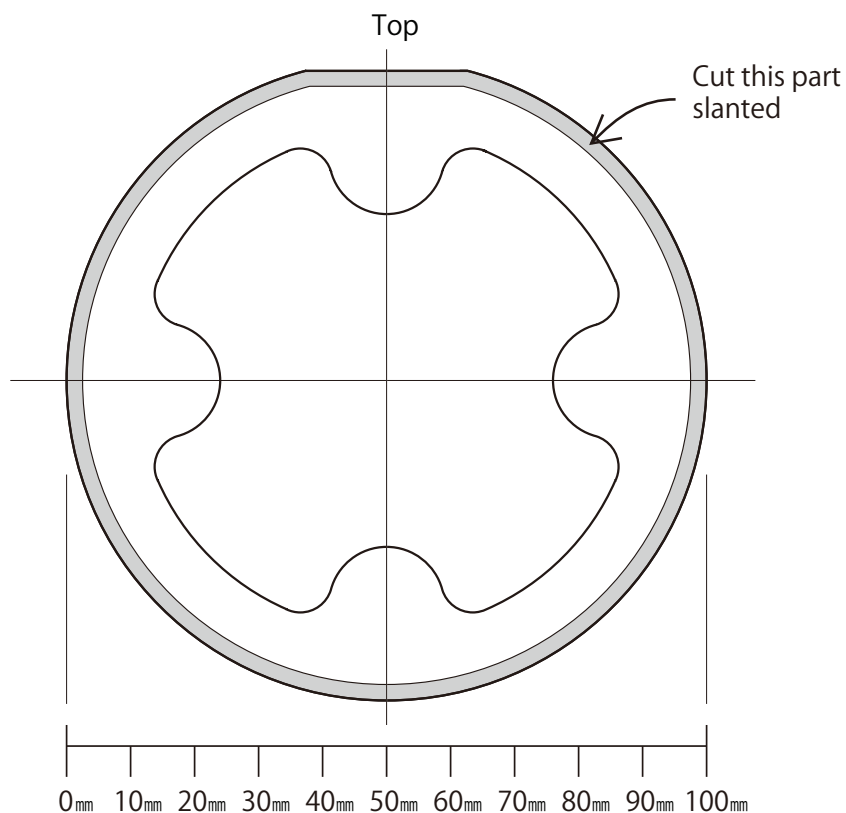


Required for flight (Purchase separately)

- BLS173SVi×6 (Aileron/Elevator)
- BLS175SV×1 (Rudder)
- R7008SB or R7003SB etc,
- MC9100A (ESC)
- ESW-1J (Receiver Switch)
- FR2F900 (Receiver Battery)
- 6-terminal box (TB16PP)
- Extension code (200J×4, S.BUS HUB 120-70mm×2, S.BUS HUB 1,000mm×1)
- Extension code for aileron (300J×1, 400J×1)
- Extension code for ESC (400J×1)
- Hook-and-Loop Tape

Figure 1/2

- Front mount
Making with 5-6 mm
hard wood



- Optional battery mount Make it from 3 mm wood plate.

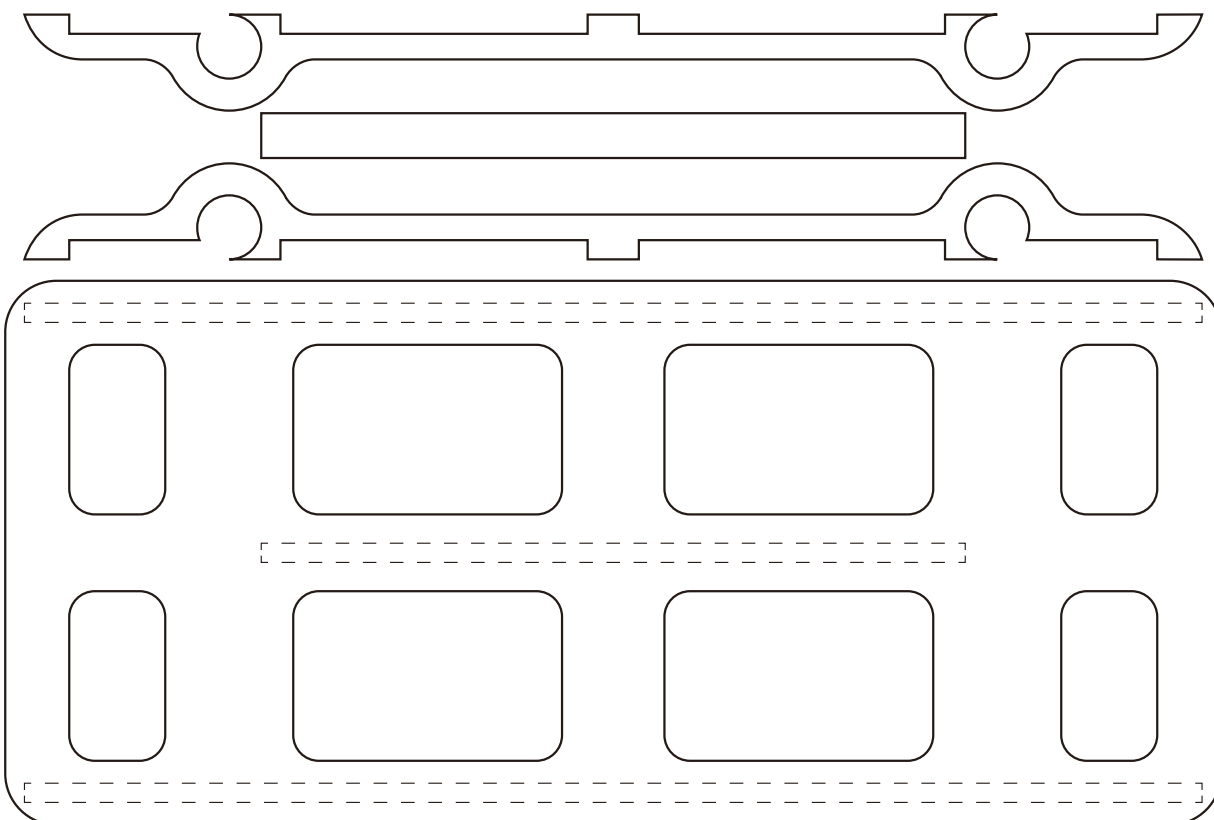
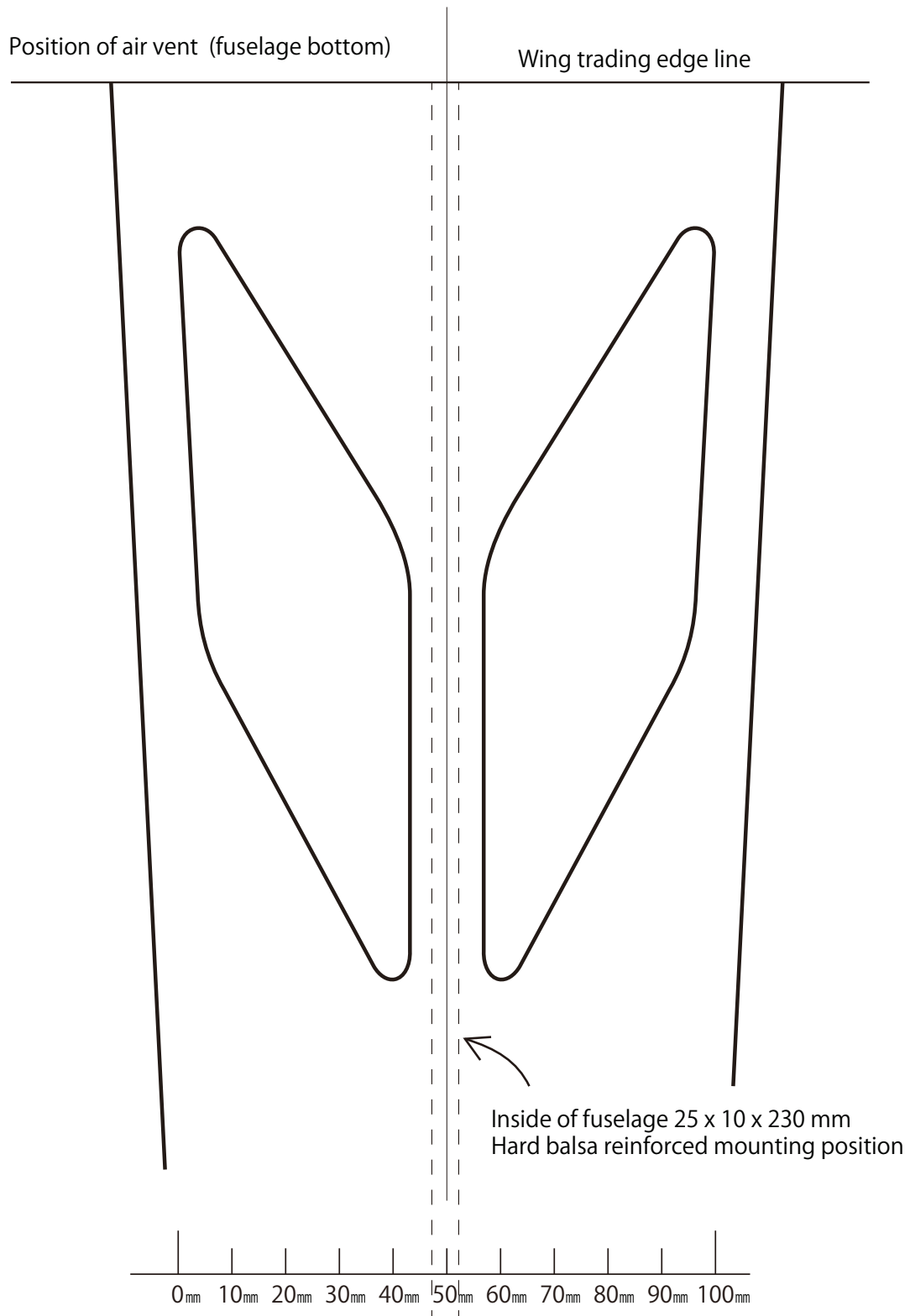
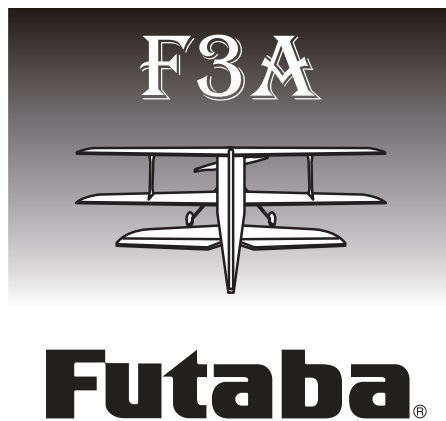


Figure 2/2





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