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TOP GUN 2017



COBRA 2018

Specifications:

Wingspan: 2300mm (90.55 inches)
Length: 2005mm (80.71 inches)
Weight: 10 to 12 Kg (22 to 26.5 lb)
Engine: 50 to 60cc gas burning
Radio: 7 channels minimum

Especificações:

Envergadura: 2300mm
Comprimento: 2005mm
Peso sem equipamentos: 4,4Kg
Peso de voo: 10Kg a 12Kg
Motorização: 50 a 60cc gasolina
Rádio: Mínimo 7 canais



JUN 050 Aeromodelo T-27 Tucano 50cc

EMB-312 T-27 TUCANO 50CC



An innovative model airplane in the popular 50cc class! High level detailing and flight performance that will surely surprise modelers and lovers of this legendary airplane.



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Assembly instructions manual and guideline

T-27 Tucano 50cc

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This is the T-27 Tucano 50cc ARF Juniaer, retracts installation ready, with flaps, with artistic finishing and several painting schemes available, very realistic and all detailed, with rivets, antennas, side door with hinge and lock installed, panel divisions, compartments, pitot tubes replicas, landing gear doors, cockpit with panels and clear canopy. Engine cowling in 2 parts with exhausts replicas. Made of high quality epoxy resin with structural reinforcements, low weight and high resistance due to the FULL COMPOSITE high technology vacuum lamination technique. Alluminum tubes on wing and stabilizer. Laminated in fiberglass and epoxy resin with carbon fiber reinforcements with laser cut plywood and balsa structures. Clear canopy, resin canopy frame, resin cockpit with panels. Factory hinged ailerons, flaps and elevators in perfect alignment. Rudder to be installed with point hinges supplied with the kit. Servo tray and tank tray in laser cut plywood. Artistic finishing made in automotive paint, vinils, decals and varnished for great durability. Very stable, realistic and acrobatic flight pattern. Capable of many scale maneuvers such as rolls, slow rolls, Cuban eight, knife edge flight, inverted flight and more. This model was developed and built to provide high performance both in terms of flight and in terms of realism and details richness. It's construction is made with specific materials of high quality and advanced techniques of composite lamination to offer low weight and high structural strength.



IMPORTANT WARNINGS

The Juniaer model airplanes are painted and varnished with high quality and resistance products. Even so, some care must be taken to protect the paint: wipe your model with a cloth immediately after use with water sprays and neutral detergent. Fuels can damage the varnish if it penetrates punctures or damages to the plane's surface, as well as cuts in the engine's cowling. To prevent this kind of problem, we recommend brushing two-component PU varnish or applying epoxy to areas that are uncovered for any reason. Avoid exposing the model to direct sunlight as much as possible, specially the darker painted parts that accumulate and reflect a greater amount of heat, causing an internal and external temperature raising. The use of automotive wax for polishing is useful in preventing the accumulation of dirt and facilitates the cleaning and protection of the varnish. We suggest the use of fabric smooth covers for storage and transport, in order to protect against damage and risks. Be careful when handling your model airplane, especially the movable control surfaces. Never lift it by the two wing tips only, as the total weight is considerable to be supported only by 2 distant points. When checking the model airplane's balance through the center of gravity (C.G.) always support it by the roots of the wing at the indicated points.

Please read this manual to the end before doing anything on your model airplane, it contains important information regarding assembly and use, and it will also give you an overview of what should be done correctly and following the guidelines.

Please check and identify all parts of your model airplane when you receive it. If any parts are damaged or defective, please contact our customer service. Your model aircraft has a 90-day factory warranty against manufacturing defects. Juniaer Model Airplanes guarantees that this kit is free from manufacturing defects in both material and workmanship at the date of purchase. This warranty does not cover any components damaged by use or modifications. In no event will Juniaer's liability exceed the original cost of the kit purchased. In addition, Juniaer Model Airplanes reserves the right to change this warranty without prior notice. Since Juniaer Model Airplanes has no control over the final assembly or the equipment used for the final assembly, no liability will be assumed or accepted for any damages resulting from the user's use of the final product assembled by him or third parties. Through the act of using the assembled product by the user, he accepts all responsibility for the result. If the buyer is not prepared to accept responsibility for the use of this product, it must be returned immediately to the place of purchase in new and unused condition. This product is intended for persons over 18 years old and any procedure involved in its assembly and use must be monitored by an adult.

This is not a beginner's model aircraft, despite having a very stable flight performance and low speed stall point, it is a complex model with many mechanical and electronic devices and must be assembled and flown by someone with experience and knowledge in the area of model airplanes setup and flying. Never consider this

product as a toy. If in any case you do not feel 100% sure of what you are doing, if there are any unanswered questions or any other problem, please DO NOT PROCEED !!! Look for our guidance or any professional in the field. Any equipment badly installed or problematic may cause the total or partial loss of the model, and serious consequences for people and properties around the flight area. If you want more information about insurance, legislation, rules and security procedures, look for the Academy of Model Aeronautics (www.modelaircraft.org) Telephones Tel.: (765) 287-1256 / (800) 435-9262 Fax.: (765) 289-4248, which may indicate clubs with a structure that includes qualified flight instructors accredited to issue the operational license for model pilots that includes insurance.

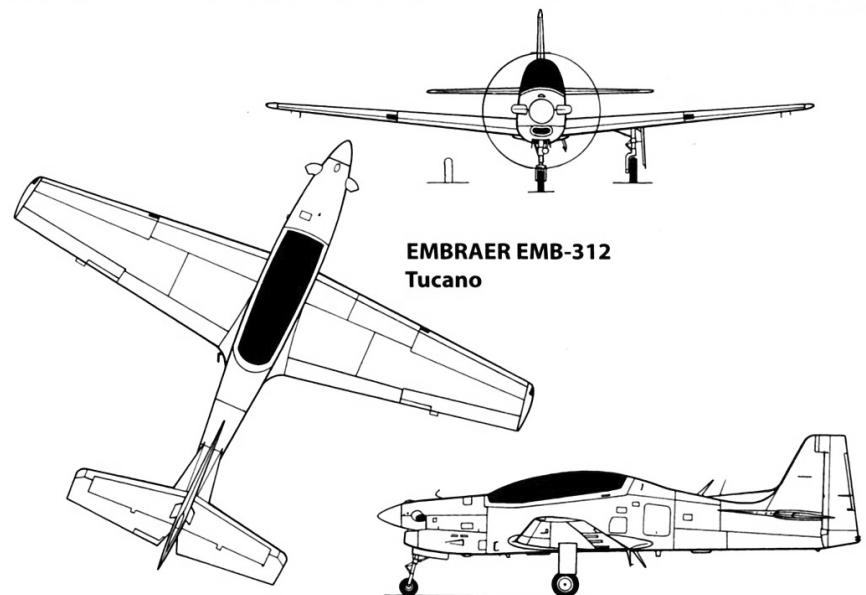
Always check the operation of the model aircraft before all flights to ensure that the equipment is working perfectly and that the structure is intact. Always check all links, connectors and control surfaces and replace any component that shows signs of fatigue or wear.

VERY IMPORTANT: Juniaer Modelismo provides a high quality kit with instructions, but the quality of the finished model depends on how it is assembled, therefore, the manufacturer and its dealers cannot under any circumstances guarantee the performance of the completed model. No complaints will be accepted regarding the performance and safety of the model aircraft after it has been assembled. "Juniaer", "Juniaer Modelismo" and "Juniaer - Art in model airplanes", as well as the logo, are registered trademarks of Juniaer industry, commerce, importation and exportation of model airplanes Ltda. All rights reserved.

Juniaer Modelism

Telephone: +55 (35) 3591-1036

e-mail: juniaer@hotmail.com



Specifications:

Wingspan: 2,30m (90,55 in)

Length: 2,05m (80,71 in)

Wing Area: 84,63 dm² (1311,76 sq in)

Wing Loading: 130g/dm² to 154g/dm² (42,59 oz/sq ft to 50,33oz/sq ft)

Spinner: 3 ½"

Engines: Gas burning 50 to 55cc 2 cycle or electric proportional.

Weight: aprox. 5 Kg (11 lb). Flying weight: 11 to 13 Kg (24,25 lb to 28,66 lb) (depends on installed accessories).

Radio: 7 channels minimum for limited installation. 9 or more channels for complete installation (not included).

Servos: 7 standard size servos (10kg-cm 130oz-in or more torque) and from 1 to 4 standard size servos (4 kg-cm 56,8oz-in or more torque). All must be metal geared.



Before installing your gas burning engine, please read the manufacturer's manual and all parts assembly recommendations carefully including exhaust, standoffs, ignition, installation, operation and maintenance. The information contained in this manual is extremely important.

The firewall of the model aircraft is provided in the correct location, with the correct angles for the installation of the engine and has markings for the 4 holes of the original mounts. Drill in the 4 positions marked with a drill and 5mm drill. Position the 4 5x20mm screws with the 5mm washers inside the firewall. Apply medium-grade (removable) thread lock to the threads of the screws and screw them into the standoffs in front of the firewall, ensuring that a solid, firm and parallel alignment is achieved between the 4 mounts (note the position of the ends of the uprights in relation to the firewall). Position the engine on the standoffs to obtain the location of the throttle and choke horns, marking on the firewall 2 points to allow the pushrods to pass without obstructions or bends and 1 point to allow the tygon tube to pass through in a way that is connected to the engine's gas inlet without bends or kinks. Drill with a 5mm drill at the marked locations.



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Assemble all parts of the engine following the guidelines in the manufacturer's manual using medium-grade (removable) thread lock on the screws to ensure that they do not come loose with engine vibration and operation.

It is advisable to attach the throttle and throttle control pushrods to the engine before fixing it permanently to the standoffs. We recommend using DUBRO Laser Pushrods (DUB 500 or DUB 501) as they are flexible, easy to install and non-metallic. Never use metallic control pushrods for gasoline engine throttles or chokes due to the high risk of noise and resonance that can affect your radio control system. Sand the ends of the pushrods' outer tubes with 80 to 120 grit sandpaper to ensure better adhesion and glue them to the firewall in the holes with minutes epoxy glue. Mount the links to the internal parts of the pushrods ensuring that they are secure and connect them to the throttle and choke control horns (ball links can also be used in these commands for easy connection / disconnection of the throttle and choke). Important: The plastic parts of the pushrods must be inside the firewall due to the heat of the engine. Connect the tygon tube to the engine's gas inlet. Pass the tygon hose and the 2 push rods through the holes in the firewall and fix the motor to the standoffs permanently, also with the application of a medium-grade (removable) thread lock.

The engine ignition module must be installed immediately behind the firewall and the spark plug cable passed through the firewall by the lower right side or through the upper part behind the firewall. For this it is necessary to make a hole approximately 30mm diameter with drill and drill.

Very important: all fuel hoses and engine cables must under no circumstances come into contact with parts of the engine block that have a very high temperature during and after operation. For this we recommend fixing them to the standoffs with nylon clamps firmly and without the possibility of moving.

Distance between firewall and prop washer: 171mm (length)

Distance between engine's centerline and engine's head end: 125mm (height)

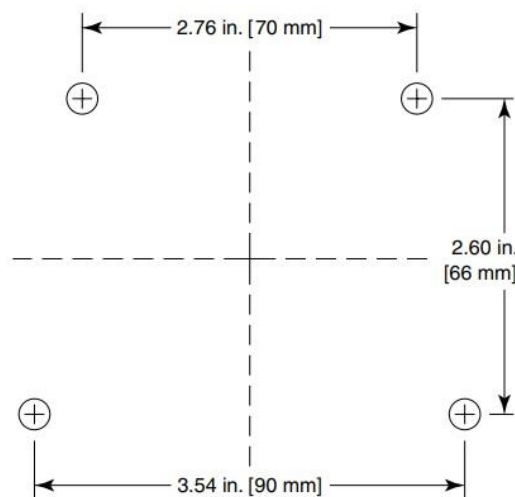


Above: ignition module installation behind the firewall on upper side (left) and lower (right).

Electric motor installation:

Suggestions: RIMFIRE 50cc Great Planes and ROTOMAX 50cc Turnigy

Before installing your electric motor, please read the manufacturer's manual carefully and all recommendations for assembly, operation and maintenance. The information contained in this manual is extremely important. The firewall of the model airplane is provided in the correct location, with the correct angles for installing the motor. Check the distance between the holes for fixing your electric motor in the standoffs and mark the 4 points on the firewall from the center between the holes already marked at the factory (drawing below):



Distance between the firewall to prop washer: 171mm (length)

The ESC (Speed Control) can be installed on the firewall, between the standoffs of the electric motor. Very important: under no circumstances should all motor wires and cables come into contact with parts of the motor and ESC (speed control) that have a high temperature during and after operation. We recommend fixing them to the standoffs with nylon clamps firmly and without the possibility of moving so that they are routed into the model through the firewall. For this, a hole of approximately 20mm in diameter must be drilled through the lower right or left side or through the upper part.



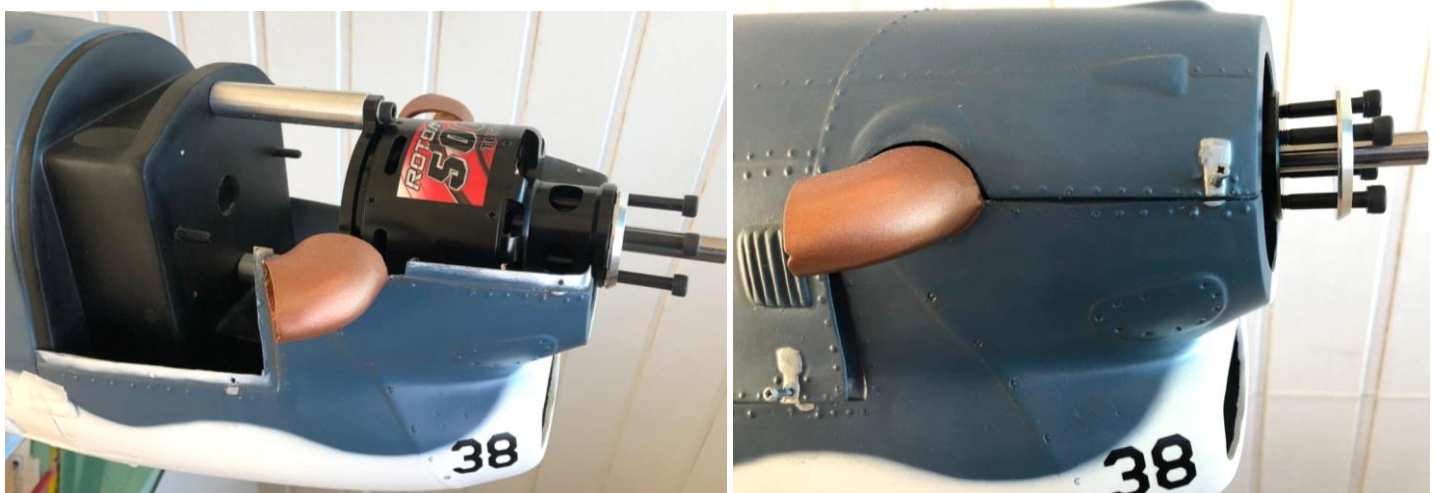
Above: electric motor installation and speed control on horizontal position (left) and vertical (right).

Engine cowling installation

The engine cowling is provided in 2 parts (upper and lower). The parts have perfect fittings among themselves and in the fuselage, providing the correct alignment according to the center between the fixing holes of the engine standoffs and the angles of the firewall, both for gasoline engines and for electric motors. Using the back plate of the spinner (3 ½ ") positioned on the propwasher of the engine/motor, position the lower part of the engine cowling in such a way as to center the spinner back plate with the circumference formed by the cowling, leaving spacing of 1 to 2mm between the spinner back plate and the cowling so that they do not touch in any position.

To fix the cowling to the fuselage, apply epoxy glue to 4 10mm hardwood cubes and glue them to the inside of the fuselage, in order to make a solid fixing point where the fixing screws will be inserted. Do the same at the fixing points at the bottom of the fairing, or use screws with self-locking nuts to ensure fastening even with high levels of vibration. With the correct alignment of the set, permanently screw the cowling parts together and to the fuselage using washers to increase the contact area with the cowling parts avoiding damage and cracks due to vibration. The screws to be inserted in the wooden cubes must be locked with a drop of medium CA glue or epoxy to reinforce the lock and ensure greater resistance.

The horizontal and vertical inclination of the spinner backplate and the front part of the cowling must be equal, parallel and centralized.



Above: inferior cowling installation (left) and both parts in correct alignment (right).



Above: parallel alignment between spinner/cowling (left) and engine axis/cowling (right).

In case of gas burning engines, an efficient cold air flow is recommended for engine cooling. The air intake at the bottom of the cowling is enough for the air flow, however it is necessary to make room for air outlet, which must be done at the bottom rear of the cowling, taking advantage of the holes for the engine's exhaust pipes. The air outlet area must be 2 times larger than the front air inlet area. We recommend 2 suggestions: use of "velocity stack", or horn, which extends the distance from the carburetor air intake, causing air to be captured inside the fuselage, through the firewall; or the installation of an air separator inside the engine cowling, making the air heated by the exhaust and the engine's head stay at the bottom and be directed out of the cowling, while the air at the top remains cooler to enter the carburetor. The air separator can be made of plywood or fiberglass or carbon fiber, fixed to the firewall with 30 to 40 minutes epoxy glue.



Above: Air separator for cooling.



We offer custom-made wooden propellers for the T-27 Tucano 50cc Juniaer (sold separately). Always consult the engine instruction manual to decide on the size and pitch of a propeller and take into account the desired performance according to the characteristics of your model airplane. 2 blade propellers are ideal for engine break-in and flight tests, as they provide higher RPM and greater speed of response to engine acceleration, while 3 blade propellers provide lower RPM, being very suitable for scale models, however, they present a lower speed of response to engine acceleration.

The JC Super Props are factory balanced, painted and varnished, contributing to the good performance and scale visual of your T-27 Tucano 50cc Juniaer.



Above: 2 blade wooden propellers to 50 to 60cc gas burning engines 20x10, 22x8 ou 22x10.



Above: 3 blade 20x10 propellers to gas burning engines(left) and 3 blade 20x10 for electric motors (right).

Fuel tank installation

To install the fuel tank, first fix the front plywood tray supplied with the model airplane with 30 to 40 minutes epoxy glue on the wooden rails inside the fuselage. The tray has openings for fixing the tank and batteries with nylon or velcro clamps. Assemble the tank connections according to the manufacturer's instructions, taking into account the chosen fueling system (read below), checking that it is free of leaks and with the clunk(s) free in all possible positions. Main fueling options: **Filling valve:** we recommend Kwik Fill DUBRO (DUB 335) connected between the fuel tank and the fuel inlet of the engine. In this case, the tank needs only 2 entry and exit routes: a clunk that fills/empty the tank and sends fuel to the engine and ventline for air and excess fuel indicating a full tank; **"T" connector:** we recommend Hangar 9 (HAN 116) connected between the fuel tank and the engine's fuel inlet. In this case the tank needs only 2 ways of entry and exit: clunk that fills/empty the tank and sends fuel to the engine and vent line for air and excess fuel indicating full tank and **Third way of the tank:** we recommend DUBRO (DUB 840) connected directly to the fuel tank via a third way, with an independent clunk .. In this case the tank needs 3 ways of entry and exit: clunk 1 that fills/empty the tank, clunk 2 that sends fuel to the engine and vent line for the exit of air and excess fuel indicating full tank. The fuel valve or the support of the fueler cap must be fixed to the firewall in plywood glued with 30 to 40 minutes epoxy or in the engine cowling, with easy access.

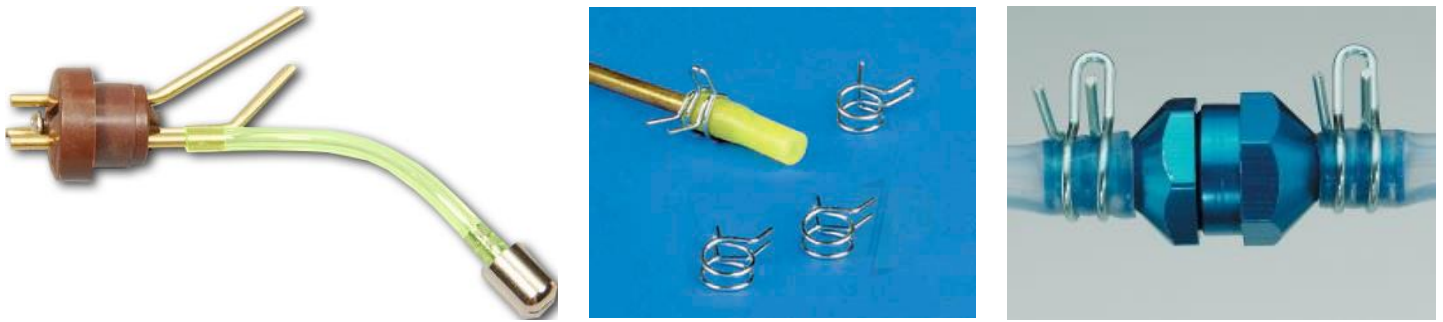
We recommend the 24oz DUBRO (DUB 424) tank (710cc) for 8-10 minute flights. It is necessary to change the original sealing rubber of the 24oz tank to use gasoline. Using the DUBRO DUB 400 rubber. If a longer flight time is desired, the 32oz DUBRO tank (DUB 690) (950cc), which already comes with the gasoline sealing rubber, can be used. For tank fuel connections, we recommend 3/32 "tygon tubes (DUB 799) and safety clips (DUB 677). Position the tank and batteries as far forward as possible and check that they are securely attached. Use a fuel filter (DUB 340).



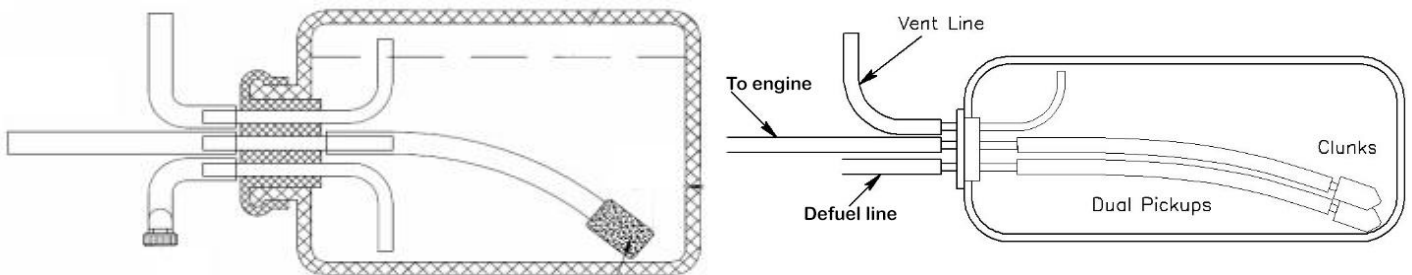
Above: fuel tank connections and gasoline tygon tubes.



Above: Typical fuel tank position and throttle and choke servos position. Johnny Simões fuelers (right).



Above: internal fuel tank connections (left), safety clips for connections (center) and fuel filter with safety clips on connections(right).



Above: fuel tank assembly scheme with 1 clunk, vent line and third line for fueling (left) and with 2 clunks (right).

Li-Po batteries for electric motors

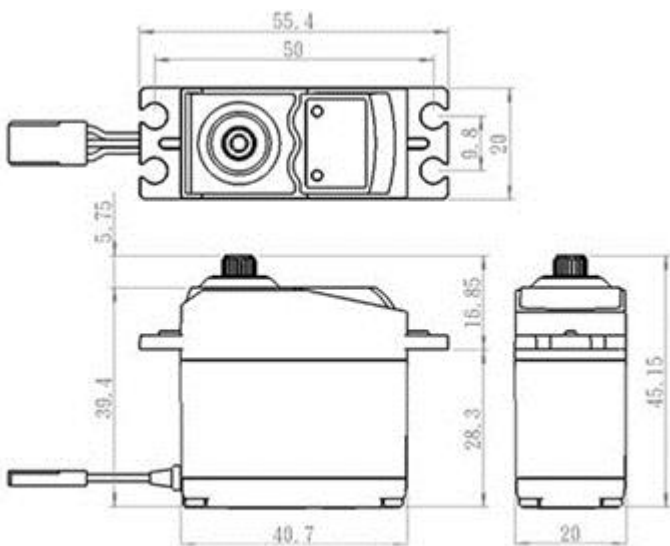


Above: Li-Po batteries used in electric motorization. Final position to be defined after correct C.G. balance.

Servos, linkage, hard points and commands

All servos must be metal geared (not included). 7 standard size servos with 10Kg-cm (130oz-in) or more torque are necessary to flight surfaces commands: 2 for ailerons, 2 for flaps, 2 for elevators and 1 for rudder. Suggestions: SAVOX: SAVSC0251MG FUTABA: S3305MG, S3306MG.

In caso of gas burning motorization it is necessary 1 servo standard size servo with 4Kg-cm (56,8oz-in) or more torque for throttle. Choke command installation by servo is optional. If you wish to make this installation it is necessary 1 more standard size servo with 4Kg-cm (56,8oz-in) or more torque. If using pneumatic retracts it is necessary 1 more standard size servo with 4Kg-cm (56,8oz-in) or more torque for air valve command. If you wish to make front wheel steering command with na independent servo it is necessary 1 more standard size servo with 4Kg-cm (56,8oz-in) or more torque. Suggestions: SAVOX: SAVSC0254MG, SAVSC0253MG, SAVSC0252MG.



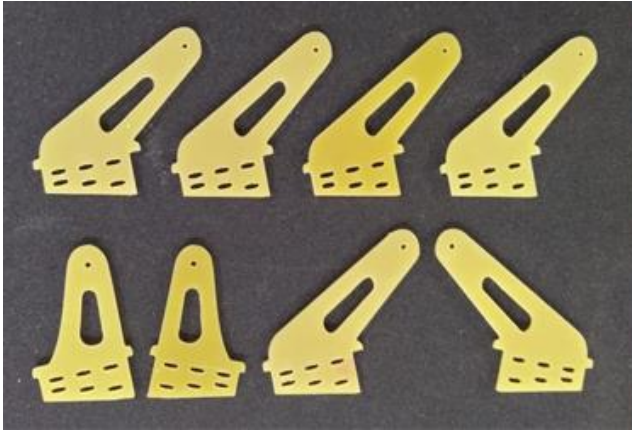
Above: standard size servo dimensions (left) e examples of indicated servos (right).

The model airplane has structural reinforcements of high rigidity for installation of the ailerons, flaps, elevators and rudder controls control horns. These points measure 4cmx4cm (1,57 x 1,57 inches), are positioned in strategic locations and must be identified according to the instructions below. If you want to modify or adapt equipment that requires modifications to the original design, never do this on your own. Please contact Juniaer through our service channels to check on the possibility of installation.

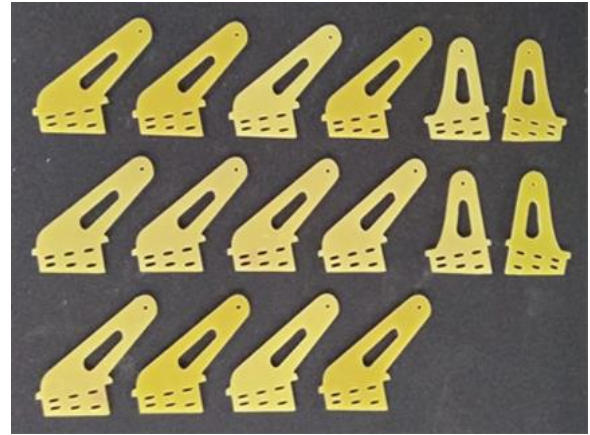
All horns must be heavy duty and suitable for ¼ scale model aircraft or for giant scale model aircraft. All servo arms must be heavy duty and suitable for ¼ scale model aircraft or giant scale model aircraft. All wires must be steel, with thread and diameter 4-40 or greater. All servo links and connectors must be heavy duty and suitable for ¼ scale model aircraft or for giant scale model aircraft.

We offer (sold separately) the sets of custom fiberglass horns for the T-27 Tucano 50cc Juniaer, in standard and heavy duty versions (double horns). To install it is necessary to make a slot with a sharp knife or drill with a 1mm drill so that the horns are inserted inside the rigid points of reinforcement up to their bases. After obtaining the correct fit, apply 30 to 40 minutes epoxy glue for permanent fixation.

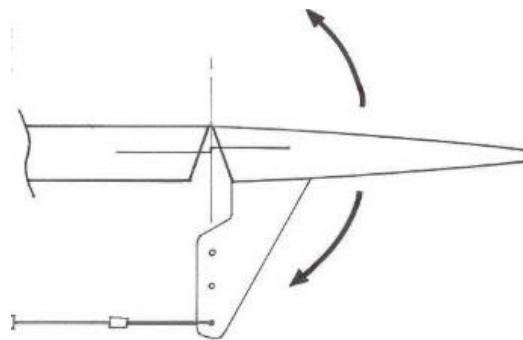
IMPORTANT: the connection point of the horns with the links must be centralized with the hinge line of the control surfaces.

Fiberglass standard horn set

Includes: 6 standard horns (2 ailerons, 2 elevators and 2 rudder) and 2 flap horns (straight) for external installation.

Fiberglass double horn set (Heavy Duty)

Includes: 12 standard horns (4 ailerons, 4 elevators and 4 rudder) and 4 flap horns (straight) for external installation.



Above: Horn slots alignment with hinge line of the command surface.

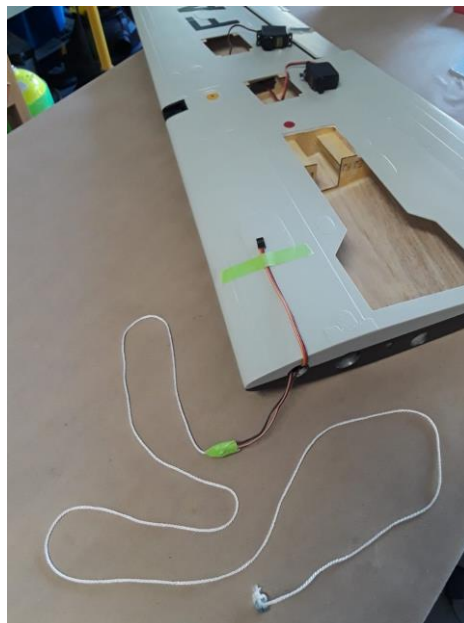
Ailerons: 2 simple horns with a height between 25mm to 35mm (1 1/8" to 1 1/4") are required. The servo arms (length between 20mm to 25mm (1") from the center to the end) must be positioned to the side of the wing root. Note that the two sides of the wing have the same position. The horn reinforcement is centered with the line formed by the slot where the servo arm is exposed. Distance between the center of the control arm and the hole of the horn (in neutral position): 92mm (3,62 in). The servos must be screwed directly to the ribs inside the wing, which are previously drilled. Before definitively screwing the servos, apply a drop of medium CA glue or epoxy glue to each hole. It is necessary to open a slot in the servo compartment cover to pass the servo arms as shown in the photos. To fix the servo compartment cover, apply a drop of medium CA glue ou 5 minute epoxy glue in each hole for better fixation and resistance to vibration. Recommended deflection: Beetween 25mm (1") (low rate) to 35mm (1 7/16") (high rate) – up and down. To measure the deflection, place a ruler at the end of the control surface and move it.

Flaps: 2 simple horns with height between 25mm to 35mm (1 1/8" to 1 1/4") are required. The servo arms (length between 20mm to 25mm (1") from the center to the end) must be positioned to the side of the wing root on one side and to the wing tip on the other side, as well as shipped from the factory. The horn reinforcement is centered with the line formed by the frieze where the servo arm is exposed. Distance between the center of the control arm and the hole of the horn (in neutral position): 85mm to 90mm (3 3/8" to 3 1/2"). The servos must be screwed directly into the ribs inside the wing, which are previously drilled. Before definitively screwing the servos, apply a drop of medium or epoxy CA glue to each hole. It is necessary to open a frieze in the lids of the servo boxes to pass the servo arms as shown in the photos. To fix the servo box lids, apply a drop of medium CA glue or 5 minutes epoxy glue in each hole for better fixation and resistance to vibration. Recommended deflection: Between 0° to 10° for takeoff and between 25° to 30° for landing. To measure deflection, place a protractor on the leading edge of the flap and move it.



Above: Servo compartment access covers location for ailerons and flaps servos and fixation holes on ribs.

To pass the servo extensions inside the wing, position it with the tip upwards and insert a thread with a weight tied at the end through the aileron servo box, passing through the hole in the wing spar to the leading edge until exit through the front hole of the wing root. Connect the extensions to the servos (aileron and flap) and lock the connectors so that they do not come loose in any situation. Tie the end of the aileron servo extension to the end of the thread in the aileron servo box and carefully pull the connector to the wing root. Attach the outer tip of the extension to the root of the wing with adhesive tape. Repeat the same process for the flap servo extension. Repeat the same process for the other half of the wing.

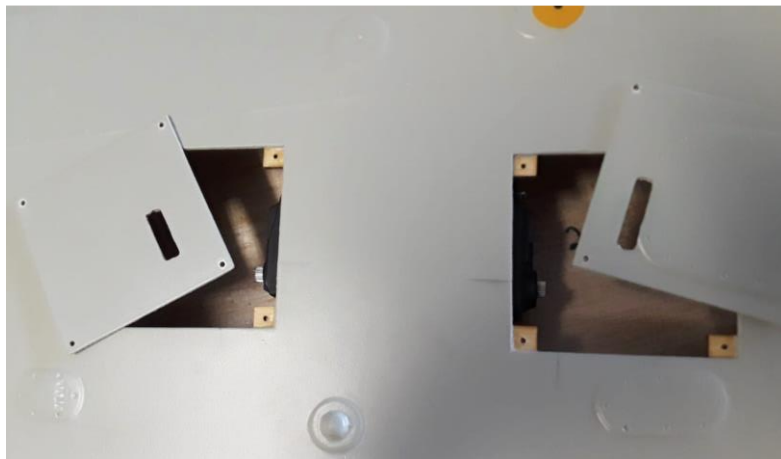


Above: thread and extensions passing process on wing (left) and connected and locked servos (right).

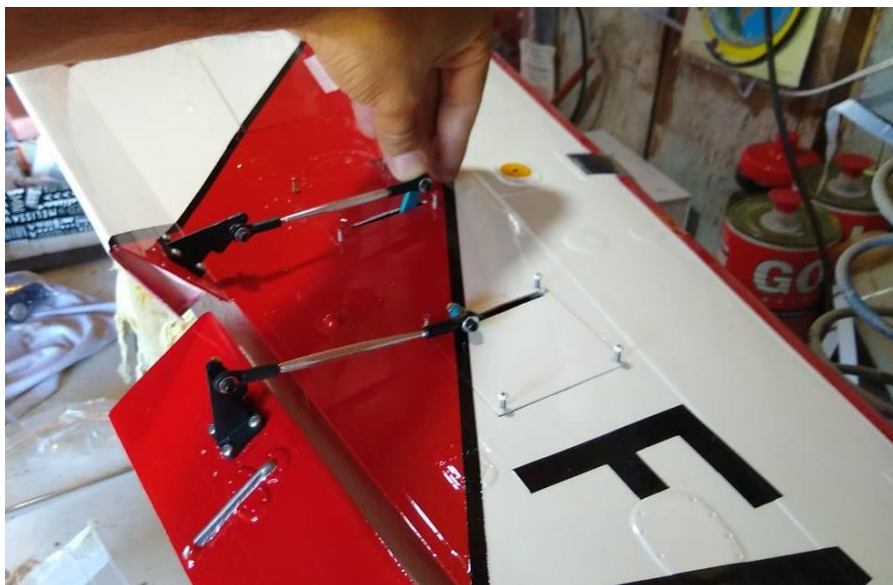
Before definitively screwing the servos, apply a drop of medium CA glue or 5 minutes epoxy glue to each hole in the ribs where they will be fixed. To screw the flap and aileron servos onto the internal ribs of the wing, use a short screwdriver to keep the screw angle at 90° in relation to the ribs, as there is little internal space. It is necessary to open a slot on the servo compartments covers to pass the servo arms as shown in the photos. To fix the servo compartment covers, apply a drop of medium CA glue or 5 minutes epoxy glue in each hole for better fixation and resistance to vibration.



Above: Short screwdriver and correct position to screw the wing's servos.



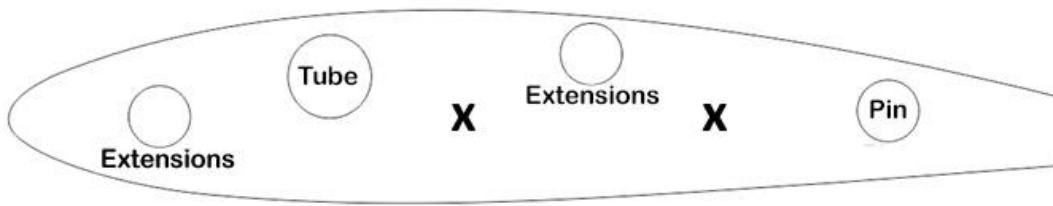
Above: Ailerons and flaps servos and servos compartment covers with slots position.



Above: ailerons and flaps servos, servo arms and horns position.

To assemble the two halves of the wing in the fuselage, an aluminum tube with 1" (25.40mm) external diameter x 1.58mm thickness x 885mm long is used. The wing / fuselage set is pre-adjusted at the factory and uses 4 allen screws 1/4 "x 3/4" and 4 washers 1/4" (supplied with the kit), 2 screws with washers on each side. Insert the tube into the fuselage until it is centered. The wing halves have 3 holes in the root, the front hole to allow passage for ailerons and flaps servo extensions and lights into the fuselage, the central hole where the

tube must be inserted and the rear hole for servos and retracts extensions. At the rear there is a pin made of 3/4 "diameter aluminum tube to align the wing halves at their correct angle of incidence (+2 degrees). The drawing below shows the position of the 3 holes and pin. Insert the halves, check that the roots of the wing are perfectly aligned with the shape of the wing in the fuselage. Insert the screws with washers into the holes in the lower part of the wing halves in the holes identified below by the letters X and tighten them until they are tight. We recommend the use of a medium-grade (removable) thread lock.



IMPORTANT: THE WING FIXING SCREWS MUST BE INSERTED OUT OF THE FUSELAGE TO THE INSIDE AND NEVER FROM INSIDE TO OUTSIDE.

CLICK

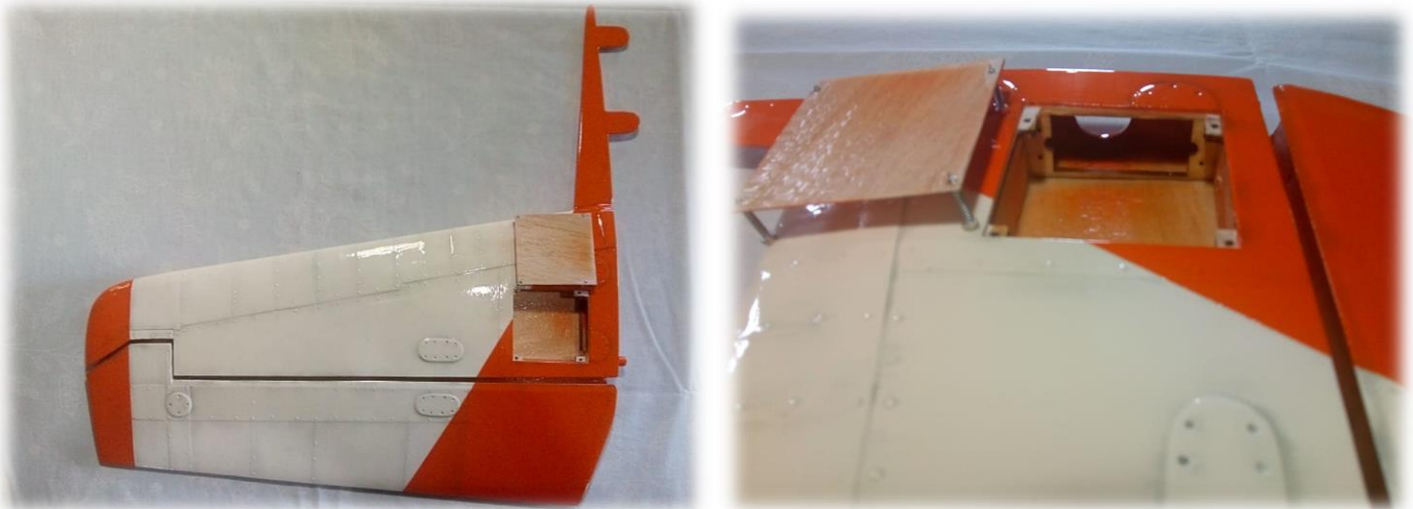
CONECTORES



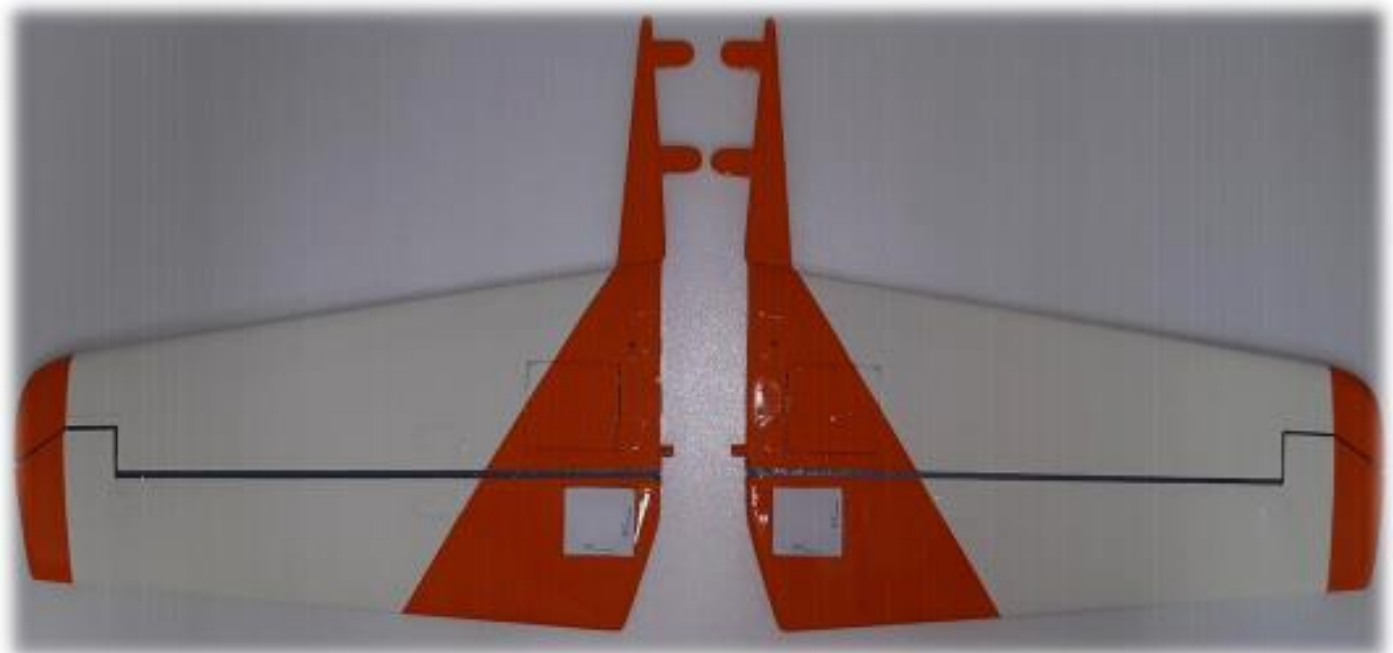
We provide Click connectors (sold separately) to join the wing servo extensions and lights kit into a single custom made quick connector for your T-27 Tucano 50cc Juniaer, contributing to the internal organization and making easier to assembly and disassembly the model airplane.



Elevators: 2 simple horns needed, 25mm to 35mm (1 1/8" to 1 1/4") tall. Servo arms 15mm to 20mm (5/8" to 13/16") from center to the end. Horn reinforcements measure 45mm x 45mm. The servos must be screwed directly into the ribs inside the stabilizer according to photos, which are previously drilled. Before definitively screwing the servos, apply a drop of medium CA glue or 5 minutes epoxy glue to each hole. It is necessary to open a slot in the roots of the stabilizer for the passage of the servo arms as shown in the photos. To fix the servo compartment covers apply a drop of medium CA glue or 5 minutes epoxy glue in each hole for better fixation and resistance to vibration. Recommended deflection: Between 16mm (5/8") (low rate) to 24mm (1") (high rate) - up and down. To measure the deflection, place a ruler at the end of the control surface and move it.



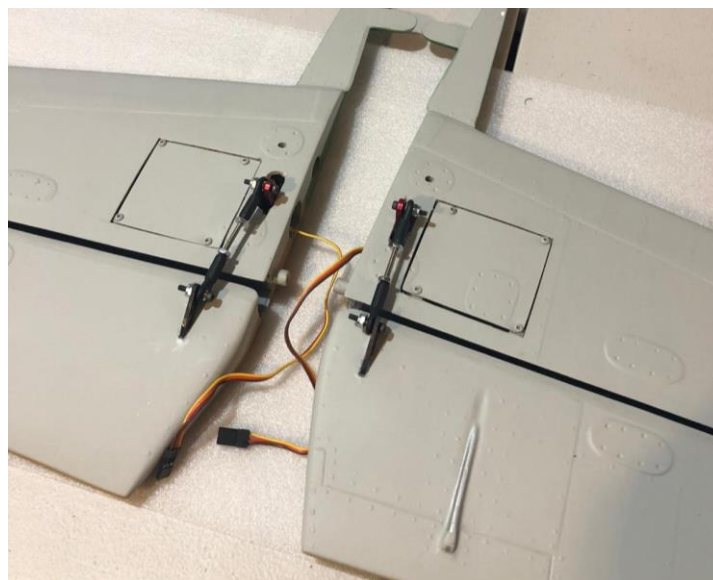
Above: elevator servo compartment access cover location(left) and servo fixation rib (right).



Above: Elevator servos compartment covers location and horns hard points location.



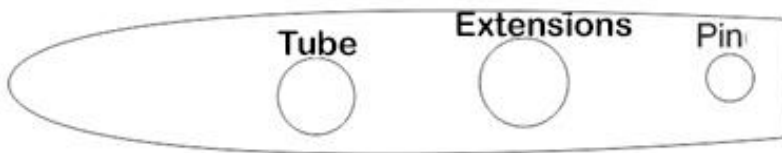
Above: elevators servos, servo arms and horns position.



Above: elevators servos, servo arms and horns position with linkage.

To assemble the two halves of the stabilizer in the fuselage, an aluminum tube with an internal diameter of 12.70mm (1/2") x 1mm thickness x 340mm length is used. The stabilizer assembly is pre-adjusted at the factory and the aluminum tube is drilled on both sides for fixation and removal with 2 selfattacking screws 2.2mm x 13mm (supplied with the kit). Insert the tube into the fuselage until it is centered, aligning the holes vertically. The stabilizer halves have 2 holes, the front through which the tube should be inserted and the rear, to allow passage of the elevators servo extensions into the fuselage. At the rear there is a hardwood pin to align the stabilizer halves at their correct angle of incidence (0 degrees). The drawing below shows the position of the 2 holes and pin. Insert the stabilizer halves. Check that the roots of the stabilizer are perfectly aligned with the shape of the stabilizer in the fuselage. If necessary, make adjustments to the pin to ensure that perfect horizontal alignment and tight fit in the fuselage. At the front of the stabilizer's fins on both sides there are 2 guides that must be inserted in the slots already made at the factory in the fuselage. The 2 guides guarantee the correct horizontal alignment of the fins and do not require gluing or fixing.

With the stabilizer halves fully inserted and in the correct position, drill a hole with a drill and 2mm drill bit at the bottom of the stabilizer halves, where there is a circle that reproduces an aircraft inspection cover. Insert the screws and tighten them until they are firm. We recommend using a medium-grade (removable) thread lock.



Above: Position of the tube in the middle of the stabilizer and fuselage (left) and detail of the hole location (indicated with the yellow letter X) for fixing the stabilizer halves in the stabilizer tube (right).

Rudder: To assemble the rudder, 3 hinge points (supplied with the kit) are required. Fill the 3 holes in the rudder with 30 to 40 minutes epoxy with a toothpick, filling all the contact areas and insert the 3 hinges until the center of the hinge is aligned with the deflection line of the rudder. Check that the hinges are correctly aligned, including the angle of deflection. Remove any excess glue with a cloth moistened with alcohol. Check that there is no glue in the center of the hinges (moving part). Fill the trailing edge of the driftage with 30 to 40 minutes epoxy glue with a toothpick in all contact areas and insert the hinges previously glued to the rudder. Observe the alignment between the rudder and the driftage so that they are as close as possible, parallel at the edges and with full deflection capacity.



Above: rudder hinge points epoxy gluing sequence.

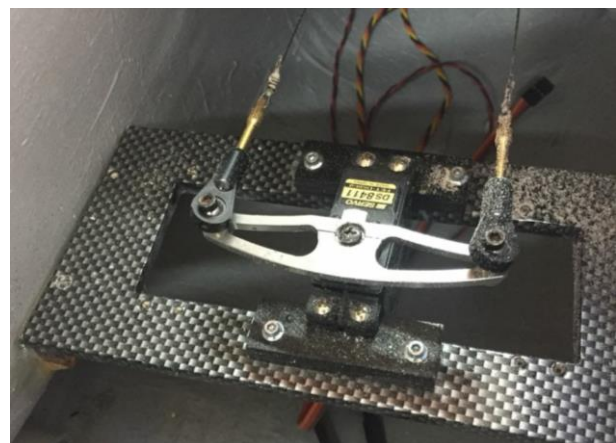
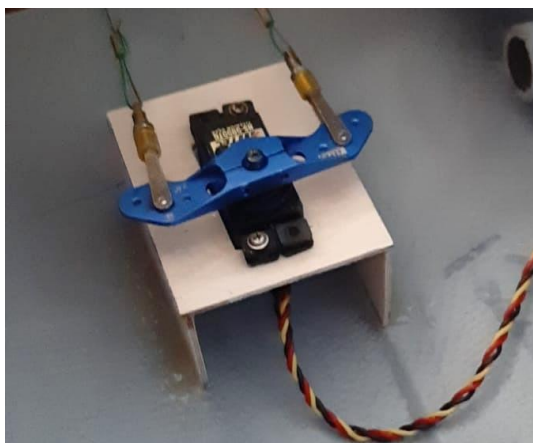
1 double horn (with control for both sides) with total length between 100mm to 120mm (4" to 4 ¾") is required. The servo arm must be double (with control for both sides) with a total length between 40mm to 45mm (5/8" to 13/16"). The horn reinforcements are centralized with the fuselage pushrod exits, through which the steel cables pass to drive the rudder to both sides. Servo installed inside the fuselage on a plywood servo tray supplied with the model airplane. Glue the servo tray to the sides of the fuselage on the wooden rails with 30 to 40 minutes epoxy glue. Adjust the servo centered on the tray and drill the 4 holes with a 2mm drill. Apply a drop of medium CA glue or 5 minutes epoxy glue to each hole for better fixation and resistance to vibration. Install the servo using pull-pull steel cables. We recommend using DUBRO (DUB 518). Recommended deflection: between 40mm (1 5/8") (low rate) to 50mm (2") (high rate) for left and right.



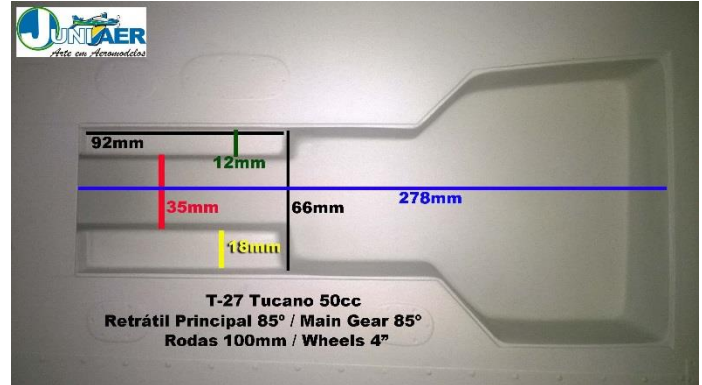
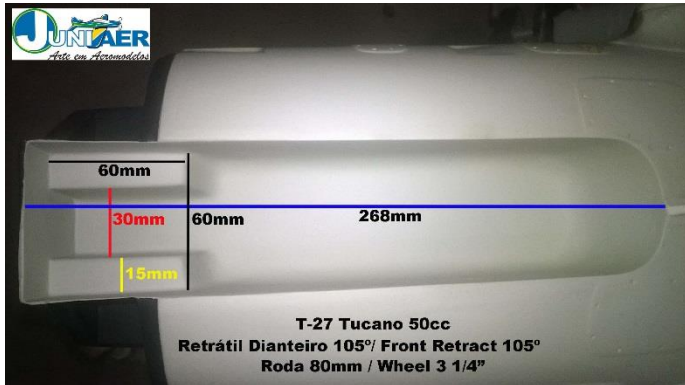
Above: elevator servo, servo arms and horns position and pull-pull steel cables exits with rudder double horn.



Above: rudder double horn (left) and rudder servo position on tray inside the fuselage (right).

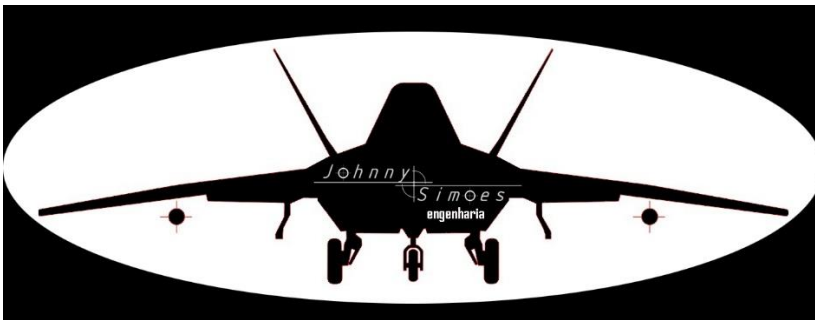


Above: the rudder servo can be installed on a ply tray glued with 30 to 40 minutes epoxy glue on the bottom of the fuselage if desired (left).

Retracts Installation: (105° on front and 85° on mains)

The T-27 Tucano 50cc Juniaer is prepared for easy retracts installation, which can be pneumatic (actuation by compressed air) or electric (actuation by electric motors). The photos above show the dimensions of the bases and compartments of the retracts. The bases for fixing the wing retracts are made of 10mm plywood and the front ones are made of epoxy resin with 10mm plywood. They are solid enough to withstand the efforts required by the normal performance of the model airplane. When defining the drilling locations for fixing the retracts to the bases, check that the wheels are centered in the compartments when retracted and that the alignment of the tires is parallel on both sides of the wing and in the front.

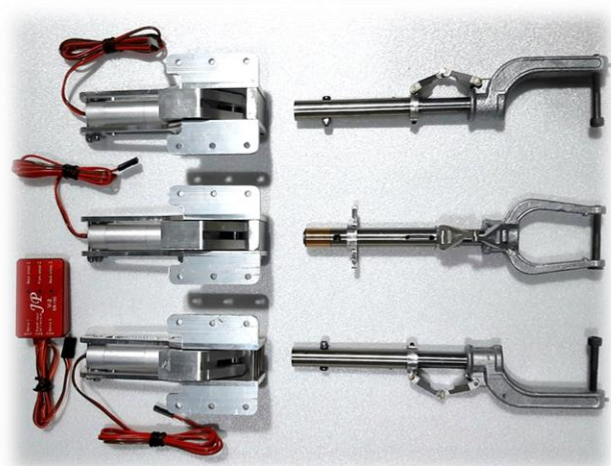
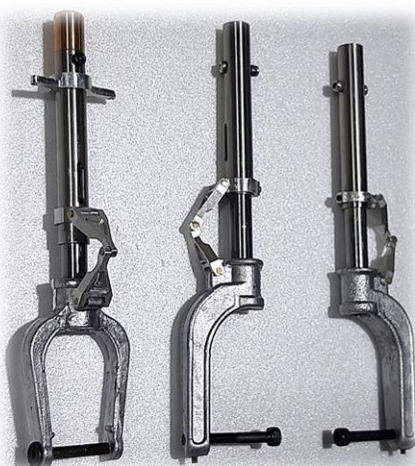
We offer 2 custom made versions, highly recommended for their robust and durable manufacture, tested successively on many models in several countries:



Johnny Simões engenharia

Retract Set Basic Version

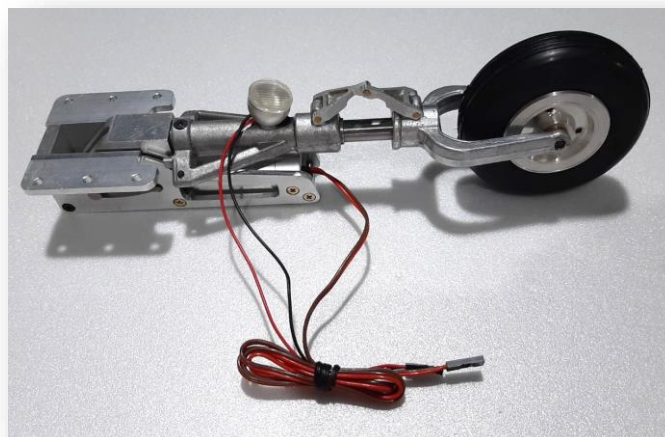
Exclusive machines machined in aluminum alloy, frames with bronze bearings, closed trunion on top for longlasting performance, electric motor with electronic controller, 304 stainless steel tube spacers, screws with self-locking nuts, supplied unpainted and without wheels. Opening angles: Main 86°20' Front 105° Total weight: 950g (33,51oz).



Retract set Scale/Competition version

Machined aluminum struts with scale detailing, pneumatic drum brakes (1-way air kit required), machined aluminum wheels with two bearings, NBR 65 to 70 shore rubber tires, exclusive machines machined from aluminum alloy, frames with bronze bearings, closed trunion on top for longlasting operation, electric motor and electronic controller, 304 stainless steel tube spacers, screws with self-locking nuts, scale headlight and 3.6v high brightness led lens, cast fork made of composite aluminum and magnesium, front scale strut cast in aluminum with 316 stainless steel tubular core, front wheel with phosphor bronze bushing and terminal levers for driving the main doors in CNC machined aluminum. Opening angles: Main 86°20'; Front 105°. Total weight: 1590g (56,08oz).

Tires diameter: 90mm main and 75mm front



There are other retracts options with suitable specifications, but their parts are purchased separately, adaptations are required for installation and require more assembly time, requiring specialized service. Below are listed the components of a set of retractables manufactured by ROBART, with pneumatic actuation:

ROBQ 636RS Main 85° retracts

ROBQ 640HDS Front gear 105°

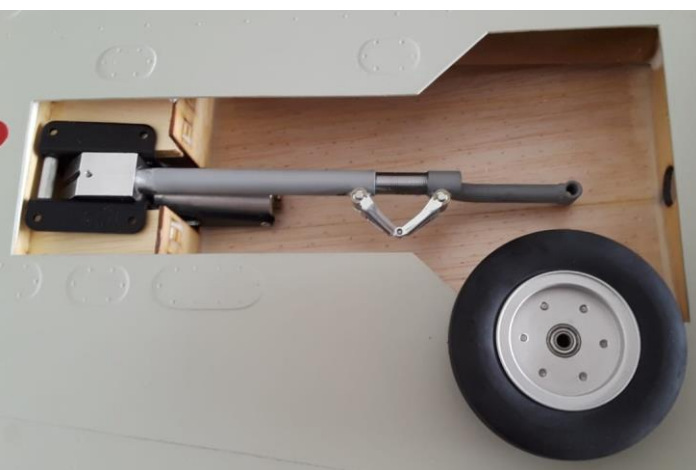
ROBQ 671R e ROBQ 671L Main struts

ROBQ 674 Front strut fork style

ROBQ 157VRX Large De Luxe air kit

ROBQ 190 Quick connectors

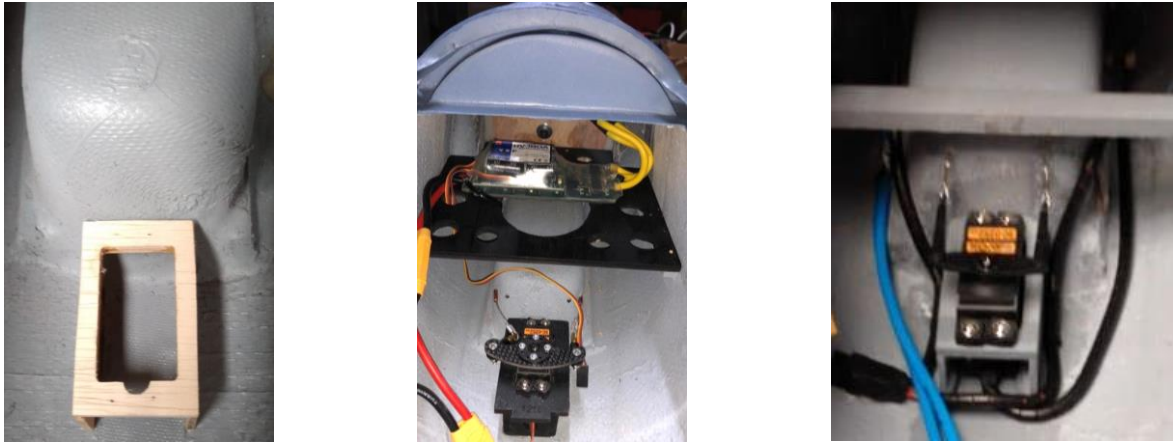
ROBQ 169 Air lines



Above: main retracts position on wing

The front wheel steering for taxi (left / right) can be done through an independent servo or with the same rudder servo. With 1 independent servo, the intensity and trembling of the front wheel control can be adjusted separately and can be turned off by mixing so as not to act when the retractables are retracted. The front wheel control servo must be attached to a centralized plywood base just behind the front landing gear compartment on the inside of the fuselage. In both cases, we recommend pull-pull linkage with steel cables and double front

wheel control arm. To pass the steel cables from the inside of the fuselage to the front landing gear compartment, drill 2 small holes with a 2mm drill bit, 1 on the left side and one on the right side allowing double control without resistance or friction.

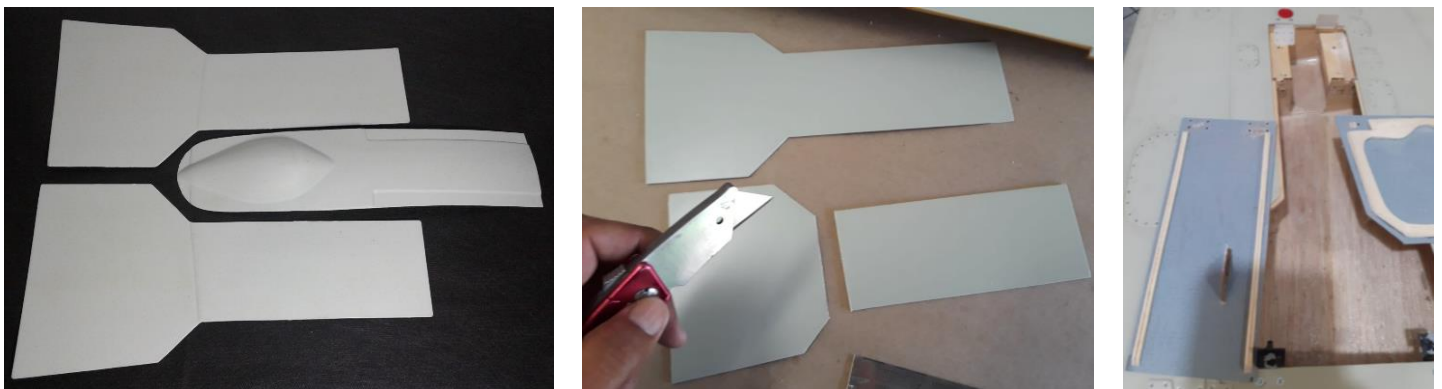


Above: servo tray for fixation(left) and steering servo with pull-pull linkage for independent front wheel steering (center and right).

Landing gear doors installation

The landing gear doors are supplied in unique pieces that need to be cut and reinforced for installation. The landing gear doors are exposed to situations of high vibration and air displacement, so they must be installed in a very safe way to avoid risks of malfunction of the retracts and / or loss of aerodynamic performance due to drag. To cut out the 8 landing gear doors of your T-27 Tucano 50cc Juniaer use a very sharp blade, metal ruler or very sharp scissors. Protect the outside of the parts with adhesive tape to prevent damage to the paint. To reinforce them, use balsa wood or light plywood of 2mm (not supplied) to be glued with 5 minutes epoxy glue. Main landing gear doors: Cut out the 2 parts of the main landing gear doors (wing) with a blade and ruler, thus obtaining 4 pieces (2 internal doors and 2 external doors). External and internal doors must be glued to the wing with 30 to 40 minutes epoxy, using 2 nylon hinges (we recommend DUBRO DUB 116) on each door or 2 compartment door hinges ROBART (ROBQ 350). Remember to check the correct alignment of the doors in the closed position to permanently glue.

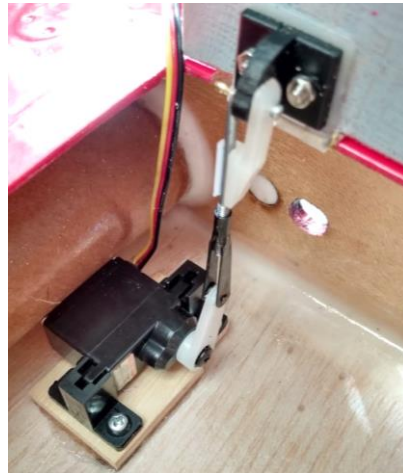
The mechanism for opening and closing the internal doors of the main landing gear can be made with micro or mini servos (must be with metal gears and with 2 kg/cm or more of torque) or with pneumatic pistons. It is necessary to install a short horn at the front for linkage.



Above: landing gear door set (left) and main landing gear doors cutted and reinforced (center and right).



Above: Dubro hinges installed on internal landing gear doors.



Above: micro servo installed with horn and linkage for mechanism acting.

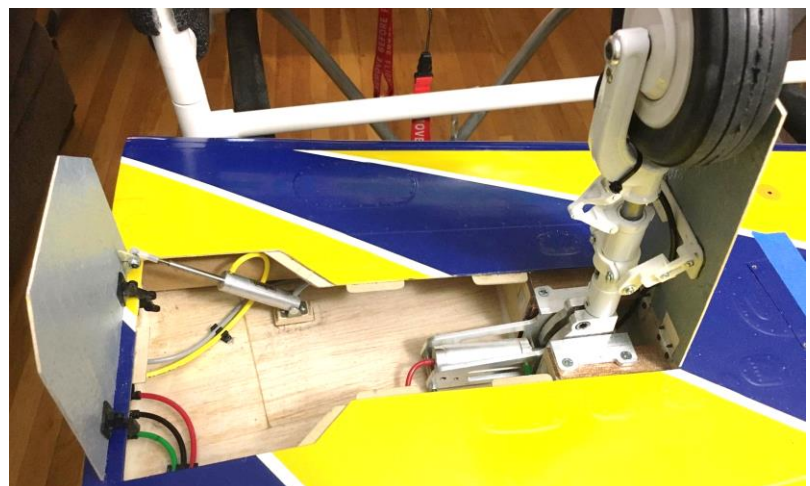


Above: door compartment hinges and micro servo installed with linkage.

The external landing gear doors are fixed to the wing in the same way as the internal doors, with hinges, and to the legs of the main landing gear with articulated supports that open and close the doors. Johnny Simões scale retracts include the brackets already installed. To attach them to the external doors, glue the 2 metal plates folded in "L" with 30 to 40 minutes epoxy glue to allow the fixation with 1 screw and nut according to the photos below.



Above: detail of the articulated supports attachment to the external landing gear door of the external landing gear and closed external landing gear door (right).

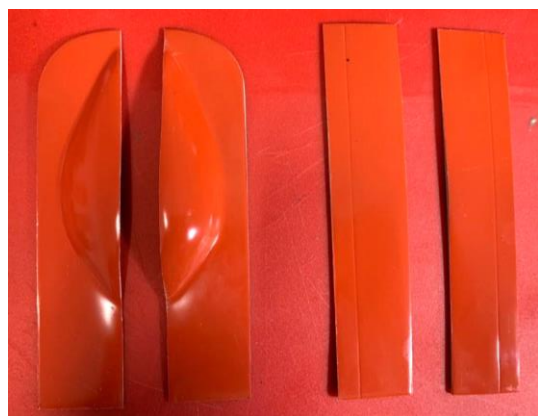


Above: detail of the articulated supports fixation to the external landing gear door of the main landing gear (left) and internal door of the main landing gear with opening and closing by pneumatic cylinder (right).

Front landing gear doors: Cut out the central part of the lower engine cowling where the front landing gear doors will be positioned. Mark and cut the 4 landing gear doors of the front landing gear from the single piece provided as shown in the photos below, with a blade or scissors.

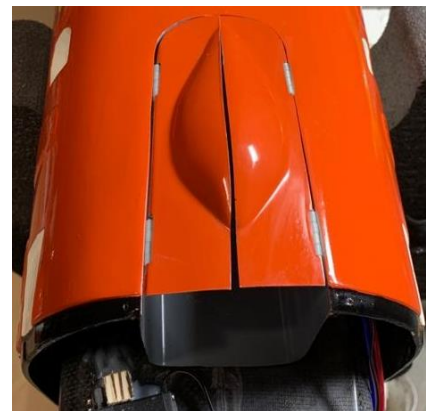


Above: Cutting process of the lower engine cowling and the 4 landing gear doors of the front landing gear.



Above: The 4 landing gear doors of the front landing gear cut out (left) and their positions (center and right).

The front and rear front landing gear doors must be glued to the lower engine cowling and to the fuselage, respectively, with 30 to 40 minutes epoxy glue, using 2 nylon hinges (we recommend DUBRO DUB 116) on each door or 2 compartment door hinges ROBERT (ROBQ 350). Remember to check the correct alignment of the doors in the closed position to glue permanently.

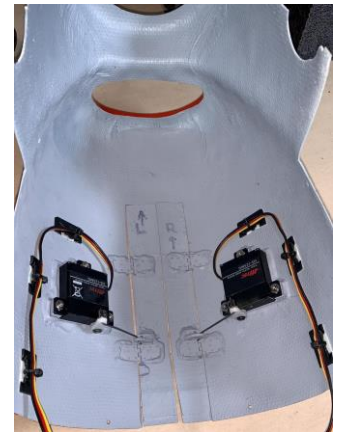
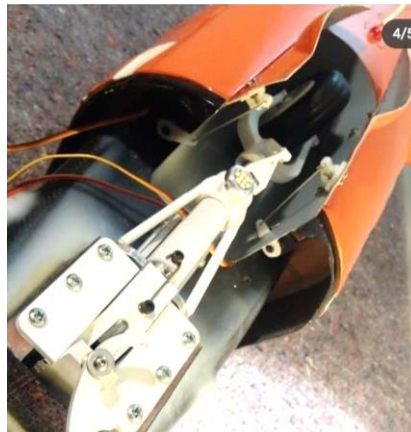


Above: fixed with Dubro hinges, the two front landing gear doors of the front landing gear in the lower engine cowling (left) and the two rear doors of the front landing gear in the fuselage (right).

The mechanism for opening and closing the doors of the front landing gear can be made with micro or mini servos (must be with metal gears and with 2 kg/cm or more of torque) or with pneumatic pistons. It is necessary to install a short horn at the front of the doors for linkage.



Above: the 2 rear landing gear doors of the front landing gear in the final position (left), the horn installed in the rear door of the front landing gear (center) and the place of attachment of the micro servo (right).



Above: left rear landing gear door servo of the front landing gear installed with linkage and horn (left), front landing gear position, rear doors, servos and horns (center) and 2 servos installed in the lower engine cowl for opening and closing the front landing gear doors of the front landing gear.

A creative alternative for opening and closing the landing gear doors of the front landing gear is the installation of a mechanism with springs and actuator, so that when the front landing gear is retracted a metal rod is lowered, making a lever through linkage and horns to close the 4 landing gear doors. When the front landing gear is extended, it releases the rod and the 4 landing gear doors open. It is a process that requires a lot of adjustment, patience and installation skill, but it does the actuation of the doors of the front landing gear, eliminating the use of servos or air pistons.



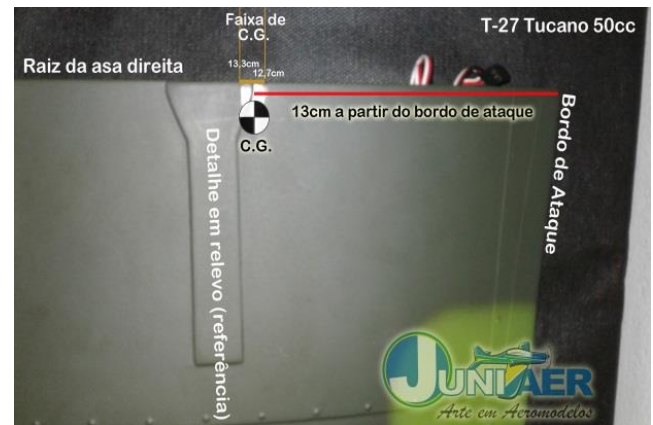
Above: installation of a mechanism for opening and closing the doors of the front landing gear.

To sequence the opening and closing of the landing gear doors, it is necessary to have a landing gear door sequencer or, if available, to mix through the radio channels. The scheduling sequence should be like the routine below:

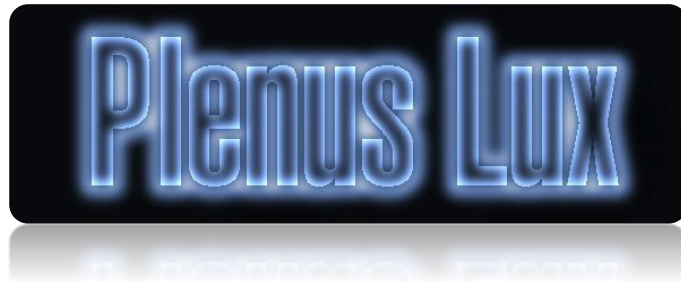
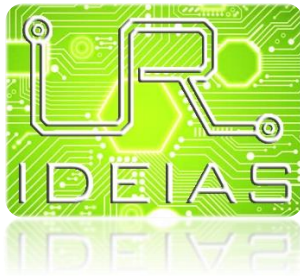
1. Landing gear and doors fully closed.
2. Opening of the 4 landing gear doors of the front landing gear and the 2 internal landing gear doors of the main landing gear.
3. Extension of the 3 landing gears (and mechanically the 2 external doors of the main landing gear).
4. Closing the 2 internal doors of the main landing gear and the 2 rear doors of the front landing gear.
5. Opening the 2 internal doors of the main landing gear and the 2 rear doors of the front landing gear.
6. Retraction of the 3 landing gears (and mechanically the 2 external doors of the main landing gear).
7. Closing the 4 doors of the front gear and the 2 internal doors of the main landing gear.

C.G. (Center of Gravity)

The C.G. range of the model airplane is between 127 mm (5 in) and 133 mm (5.23 in) from the leading edge of the wing and the C.G. point is 130 mm (5.11 in) from the leading edge, measured at the root of the wing. The wing chord measures 453 mm (17,83 in). To check the balance, hold the model in the inverted position by the wing root part at the indicated point, without fuel. Retracts must be retracted. The model airplane must have a nose weight tendency. Never support the model aircraft supported only by the wing tips, always by the roots (closest to the fuselage). Never take off your model airplane without checking that at the C.G. point the balance has a nose weight tendency because a tendency for tail weight will cause the model not to fly properly, which may cause damage and / or accidents including total loss of equipment and risks to people and property.



Notes: model airplanes with artistic painting that require greater paint overlapping and more adhesives have a greater total weight. In the case of electric motorization, it is not necessary to add weight to obtain the correct balance of the C.G., and the position of the Li-Po batteries must be defined at the end of the assembly. In the case of gas burning engines, balancing is more delicate, making it necessary to position batteries and ignition module close to the fire wall from the inside of the fuselage. All fuselage servos and equipment in general should be positioned as far forward as possible, with the exception of the receiver(s) which must be at least 50cm away from the ignition module to avoid noise or resonance that may cause interference, malfunction or loss of signal. We do not recommend using large equipment trays inside the model airplane, especially at the rear of the cockpit area. It may be necessary to add extra weight to the nose of the model airplane to achieve the correct C.G. balance depending on the total weight and positioning of the equipment in front of or behind the C.G. If necessary, add weight with lead bars until you reach the correct balance of your model as described above. Note that in the case of vertical acrobatic performance it is very important to define a very sharp nose weight tendency to allow for the recovery of flat screws, lancebacks, stall turns and other vertical maneuvers safely.



We offer (sold separately) the custom scale lighting kit for the T-27 Tucano 50cc Juniaer, in Plenus Lux (standard) and Plenus 5 (extra shine intensity) versions.

PLENUS LUX - Specifications:

Voltage: 12v Recommendations: Li-Po 3S 11.1V 850 mAh to 1350mAh.

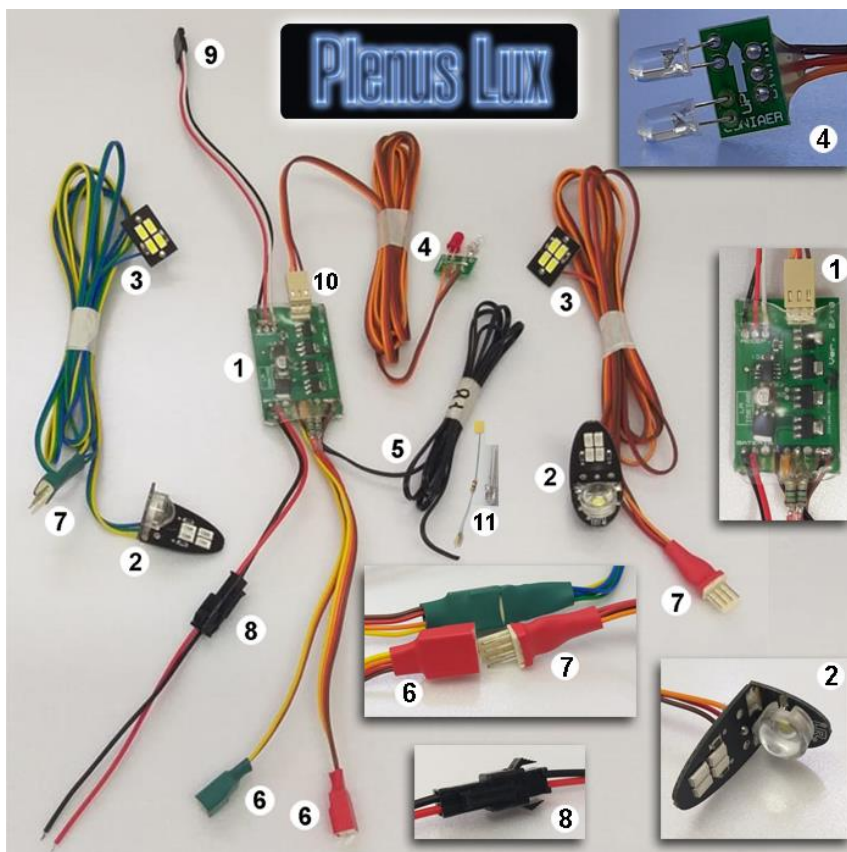
Receiver independent power supply, exclusive battery for the system.

Current consumption: 400ma - peaks of 730ma Minimum recommendation: li-po 3S 650ma 5c

Activation: Activated by PWM-Pulse Width Modulation, connected to a receiver channel. Compatible with all radio brands. Anti-interference filter.

Strobo Leds: Type SMD-Surface Mount Device (Surface Mount Components), 11,000K white light, 3w light emitting power, with 120 ° lens. 1 led is used on each side of the wing.

Leds wing landing lights: Type SMD white light 11,000K, light output power 2W each. 2 leds are used on each side of the wing. Left side navigation LEDs: SMD type red light, light output power 2W each. 2 leds are used on each wing tip. Right side navigation LEDs: SMD type green light, power output 2W each. 2 are used on each wing tip. Left and right identification printed on the board. Led front landing light: Led Top 5mm, white light 11.000K power 1 / 2w. Rudder navigation LEDs: 2 5mm hat-type LEDs, white and red light, 11,000K, power 1 / 2W. Identification with up arrow printed on the board. It is recommended to disconnect the battery from the circuit when not using the model aircraft for more than 5 days.



Main board (1) 50x36mm lighting system. 150mm wires and universal plugs for battery (8) and receiver (9), 1000mm led wire to front landing light (5) (led and resistor sent without soldering) (11) and rudder extension plug (10).

Left side extension (wing tip 1250mm and landing lights 550mm). 3-pin plug to main board (7).

Right side extension (wing tip 1250mm and landing lights 550mm). 3-pin plug to main board (7).

Wing Tip Boards (2): 35x22x20mm-correct format for installation. Landing lights boards (3): 18x11mm

Rudder extension 1700mm. 3-pin plug to main board (10). Rudder main board (4): 18x19mm.

It is necessary to connect the circuit to a receiver channel controlled by a 3-position switch on the radio. When the system is connected to the battery, the circuit performs a self test by turning on all the lights for 1 second, indicating its perfect functioning. The radio control switch in the maximum position turns on the circuit, turning on all the lights (fixed and flashing), in the middle position, it turns off only the landing lights and keeps the navigation lights on and in the minimum position turns off the circuit, turning off all the lights.

Note that the boards are labeled on the right (green light) and on the left (red light). To pass the lighting kit wires inside the wing, position it with the tip up and insert a thread with a weight tied to the tip through the hole in the wing tip until it comes out through the front hole in the wing root. Tie the connector of the wing light extension to the end of the thread at the end of the wing and carefully pull the connector to the root of the wing, leaving the light board of the wing tip on the outside. With a 90° bent wire, pull the wires from the landing light board through the opening in the leading edge of the wing and pull the plate to the outside. Repeat the same process for the other half of the wing.



Above: weight on thread tip to pass the wires and wire to pull the wing landing light plates (left).

To fix the main board on the model airplane, the boards on the wing tips, landing lights and rudder board, use 3M high-adhesion double-sided tape (red). Before gluing the tapes, apply 3M 8250 adhesion promoting primer to the contact surfaces for a good result. The landing light led and resistor are shipped without soldering as an option (see details in the enclosed leaflet). With Johnny Simões retractables the led is included and installed, requiring only welding the wires.



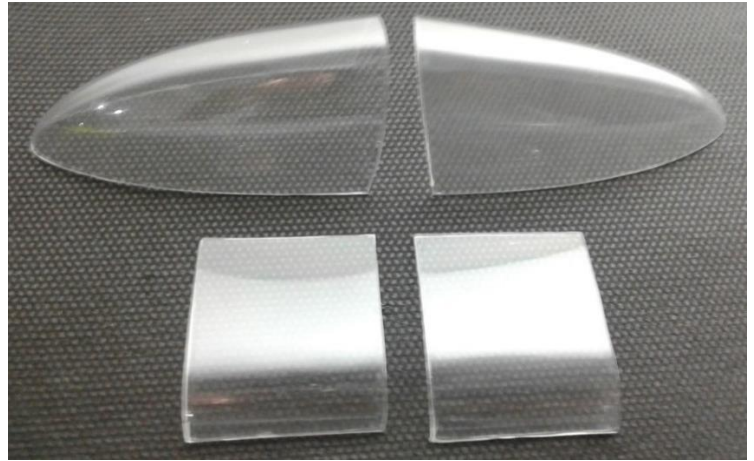
Above: Correct locations for fixing wingtip light boards (left) and landing lights (right).

The clear parts for navigation lights and wing landing lights are supplied in a thermoformed set. Cut out the parts of the set with very sharp scissors and then remove the back and sides following the embossed reference line. With a 280 to 320 fine grit sandpaper, finish the cut parts, sand the inner ends of the clear parts without excess and in the places of the wing where the parts will be glued for better adhesion. Note that there are 2 right parts and 2 left parts. To glue after installing the light kit, use white canopy glue and attach the clear parts with good adhesion masking tape, allowing to cure for 12 hours. After curing, remove the tapes and clean any

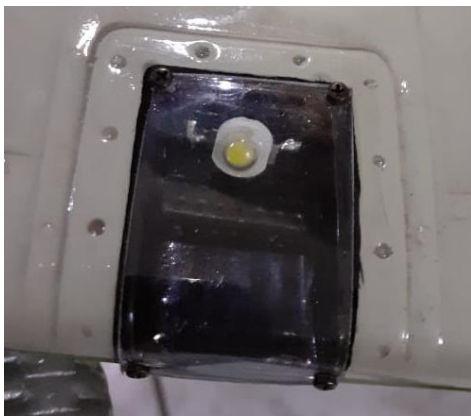
tape or glue residue. We recommend ZAP Formula 560 (PT-56). Never use CC glue to glue these parts, as the evaporated gases stain and damage the clear plastic material.



Above: Parts cut from set.

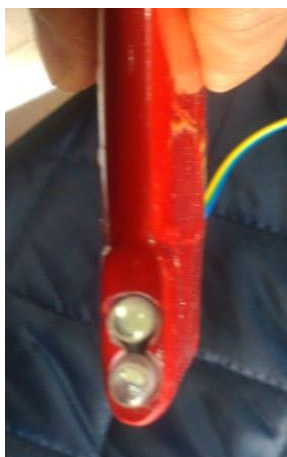


Above: desired parts shape.



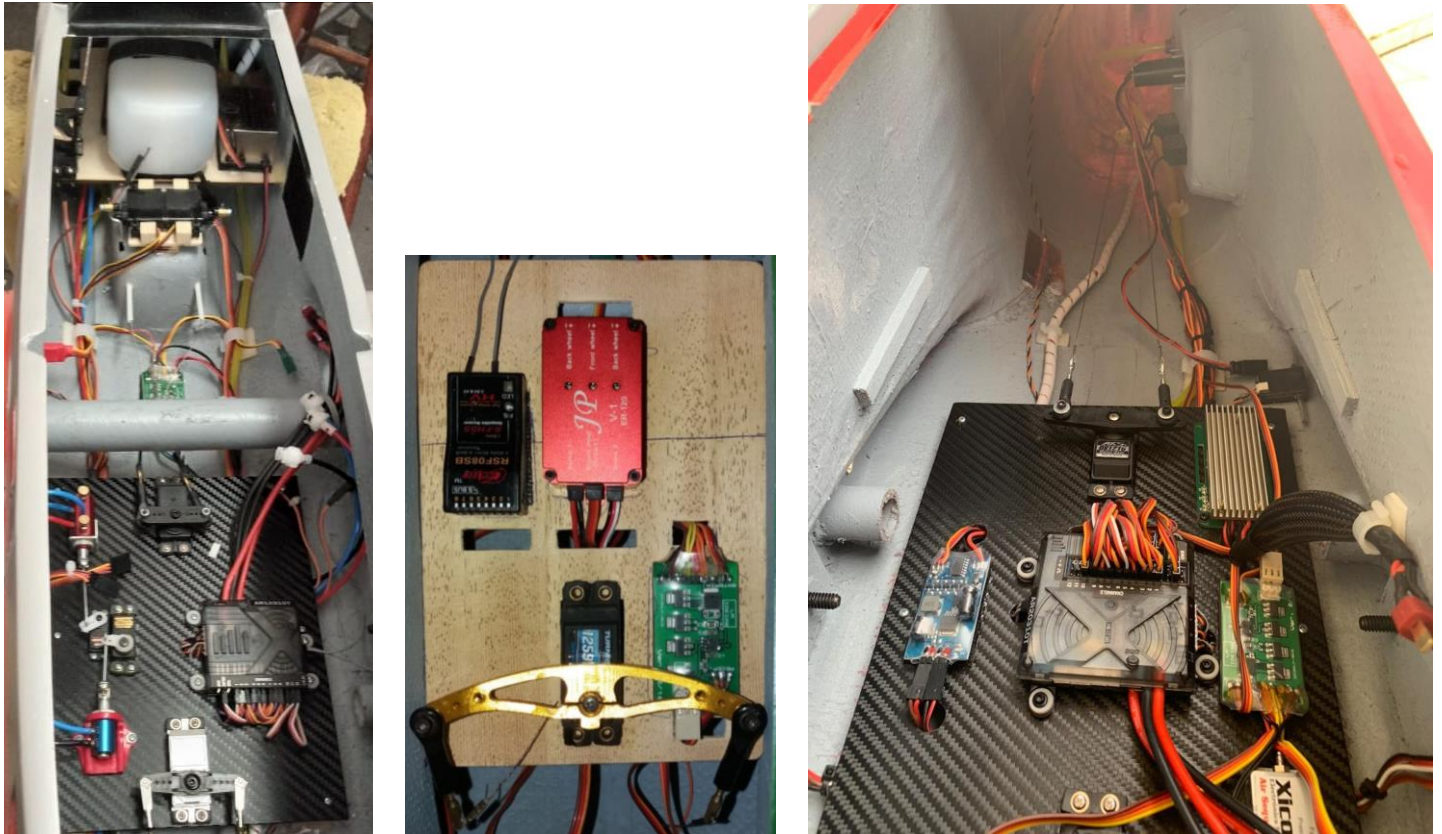
Above: clear plastic parts glued at correct places.

To pass the rudder wires inside the fuselage, position it with the rudder facing upwards and do the same process used on the wing through the lower rear part of the rudder until it comes out. Tie the rudder board to the thread and carefully pull it until the 2 leds are on the outside.



Above: rudder lights board installed at the bottom rear.

The T-27 Tucano 50cc Juniaer has plenty of internal space to accommodate on-board equipment such as receiver, retractable controller, light controller, landing gear door sequencer, among others. We do not recommend the installation of very large or heavy trays at the rear of the fuselage when gas burning engine is used for correct C.G. balance. Below are some examples of assemblies and installations of this equipment. Always remember to fix all components very well and lock all splices and servo connections and equipment extensions as they will be subjected to high levels of vibration due to the operation of the gas burning engine. Test the functioning of all components of your model aircraft before flying.



Above: equipment installation examples in the fuselage interior.



Above: equipment installation examples in the fuselage interior on electric motor version and Li-Po batteries position.

Control Surfaces Recommended Deflections:

Ailerons: Between 25mm (1") (low rate) to 35mm (1 7/16") (high rate) – up and down

Elevators: Between 16mm (5/8") (low rate) to 24mm (1") (high rate) – up and down

Rudder: Between 40mm (1 5/8") (low rate) to 50mm (2") (high rate) – left and right

Flaps: Between 0° to 10° for take off (we recommend 1°) and between 25° to 30° for landing

Fuselage side door

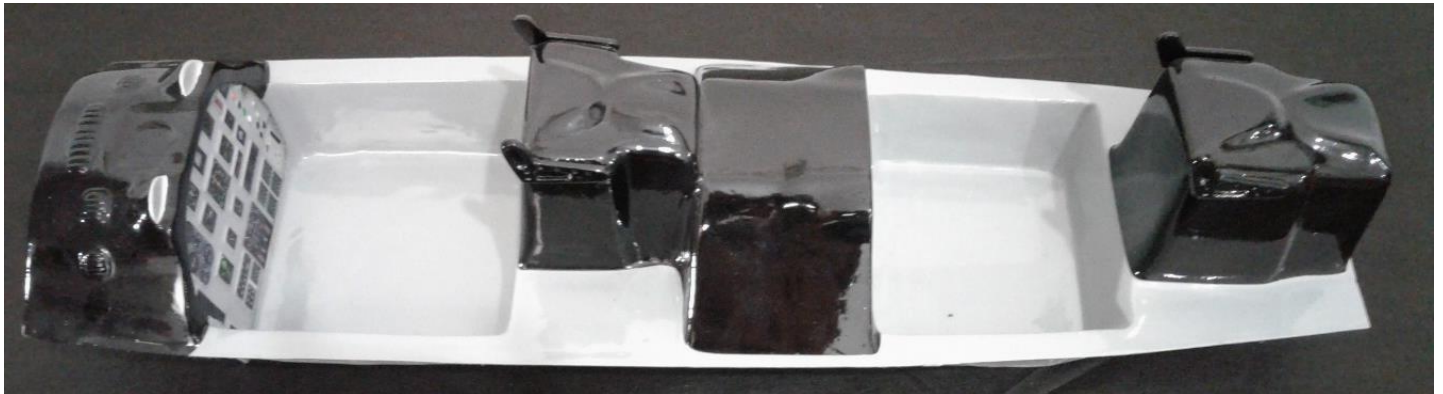
Your T-27 Tucano 50cc Juniaer has a side door where the luggage compartment is on the aircraft. The door is already installed at the factory with a hinge and lock. Inside there is enough space to easily install on / off switches, air supply, pressure gauges, tachometer, access to charge batteries, voltage monitors, etc ...



Above: internal compartment of fuselage side door installed accessories examples.

Cockpit and canopy installation

The stock cockpit fits perfectly in the fuselage and is removable. It is not necessary to glue or attach to the fuselage. The canopy frame will keep you in the correct position.



Above: stock cockpit.

To glue the instruments panels adhesives use the drawings below as reference:



Above: front instruments panel (left) and rear instruments panel (right) T-27 Tucano.

We offer (sold separately) custom made pilot busts for your T-27 Tucano 50cc Juniaer, made of fiberglass with epoxy resin, low weight, painted and varnished according to the painting scheme for greater realism.

Base width: 11cm; base length: 4.7cm; height: 12cm and weight: 30g. To glue the pilot bust to the cockpit, use 5 minutes epoxy glue, applying it to the inner bottom of the base and fixing it to the desired location with good adhesion masking tape until the glue is fully cured.



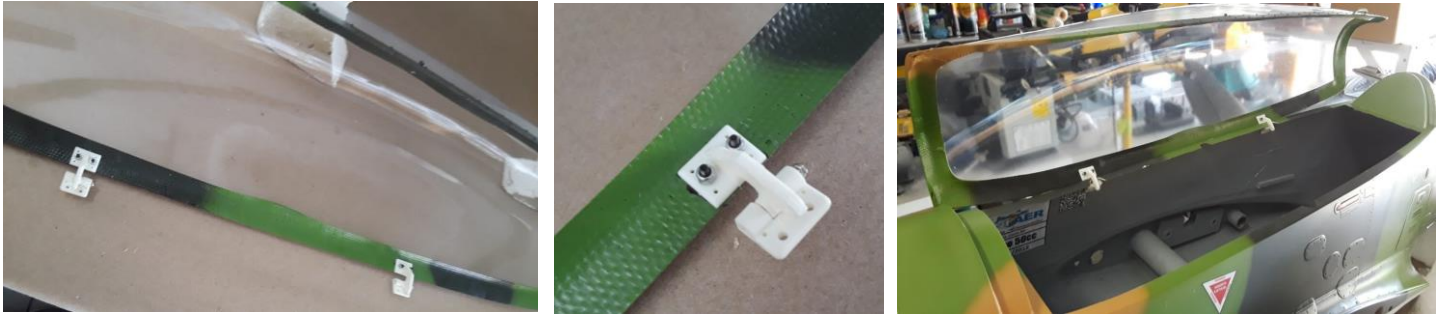
Above: pilot busts in different painting schemes (left) and pilot bust glued to the stock cockpit (right).



We offer (sold separately) custom cockpits for your T-27 Tucano 50cc Juniaer, extremely detailed and realistic, ready for installation to replace the stock cockpit. Supplied in two versions: shallow cockpit, for pilots' busts and full cockpit for scale competition, with complete bottom, for full body pilots.



To make the canopy / frame set with side opening there are 2 hinge options: internal or external. The opening is made from left to right, so the hinges must be attached to the right side of the fuselage. With internal hinges, 2 door/compartments hinges are used. We recommend ROBERT (ROBQ 350). The attachment locations of the hinges on the canopy frame must be on the same line to allow opening and closing without friction or deformation (see photos below). Make a simulation of opening and closing before fixing the hinges permanently. If necessary (depending on the hinges used) make slots on the fuselage edge to allow full movement of the hinges during the opening and closing of the canopy. It is very important that the hinges are securely attached to both parts. Apply 30 to 40 minutes epoxy glue and screw the hinges to the frame locking with self-locking nuts (parlock).



Above: internal hinges fixation for canopy side opening.

To lock the canopy / frame assembly in the closed position on the fuselage, use a piece of horn or servo arm with a hole to be fixed on the canopy frame and a spring-loaded lock as shown in the photos below. You can take advantage of the location of the replica of the canopy opening lever (see photos below). Make a slot to allow the lever to pass outside the fuselage and fix the lock on the inside with 30 to 40 minutes epoxy glue, considering the position of the horn or servo arm so that the closing is very tight and secure.

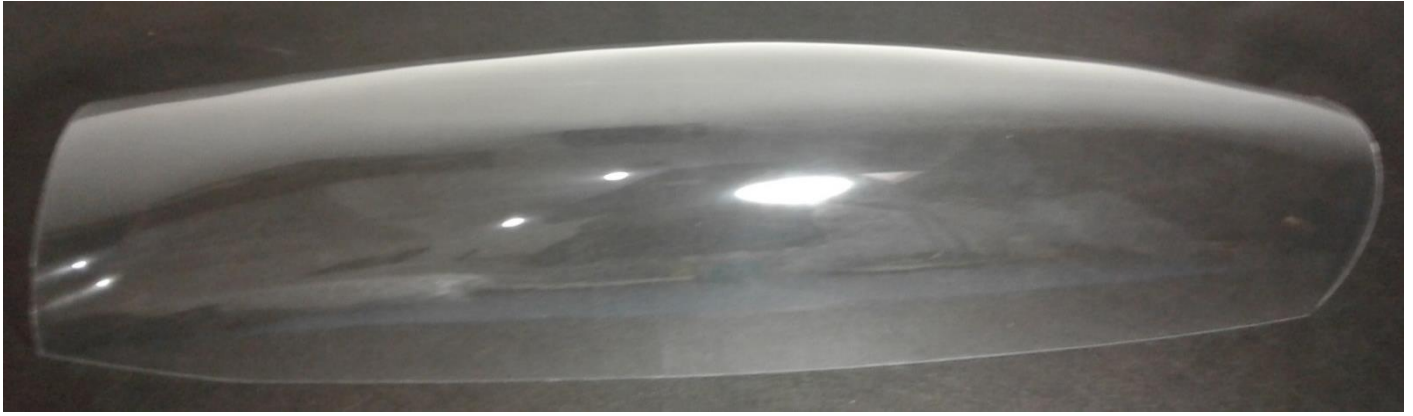


Above: lock position of the canopy / frame assembly on the fuselage.



Above: locking the canopy assembly / canopy frame inside the fuselage.

The clear canopy is supplied in a thermoformed part. Cut out the canopy in the correct shape with very sharp scissors, remove the back and front following the embossed reference line. Finish with a fine sandpaper 280 to 320. Sand the inner edges of the canopy without excess sand and at the contact points of the canopy frame where the canopy will be glued for better adhesion. To glue, use white canopy glue and attach the canopy set / canopy frame to the fuselage with good adhesion masking tape, allowing to cure for 12 hours. After curing, remove the tapes and clean any tape or glue residue. We recommend ZAP Formula 560 (PT-56). Never use CA glue to glue these parts, as the evaporated gases stain and damage the clear plastic material.



Above: correct desired shape of the clear canopy after cutting.



Above: clear canopy cutted and ready to glue (left) and glued and in place with masking tape.

If you want to ensure that the canopy and the canopy frame are fixed for competitions, drill holes with a 1mm drill and driller and screw the canopy into the frame using 2 1.5 x 5mm screws on the front, 2 on the central support part and 2 on the rear, as shown in the pictures below. Also screw the frame onto the fuselage using 2 2 x 10mm screws, one on the front and 1 on the back.



Above: Screws to ensure total security when attaching the canopy and canopy frame.

Pitot tubes replicas

The two pitot tubes replicas must be glued with 5 minutes epoxy glue to the bottom of the wing at the locations outlined with the shape of the base, 1 on the right and 1 on the left, with the tip of the tube facing forward.



T-27 Tucano 50cc transport and protection covers

We provide (sold separately) protective and transport covers made of durable padded material. Wing covers with zippers and handles, with wing tube housing. Stabilizer covers with zipper and fuselage cover with velcro. Custom-made for your T-27 Tucano 50cc Juniaer.





T-27 Tucano 50cc Juniaer was ranked fifth in the Top Gun 2017 X-Class, an innovative category that allows ARF's model airplanes, held in Lakeland, Florida, United States.



T-27 Tucano 50cc Juniaer was Brazilian Scale Championship Champion in 2018 on Sport category.

<https://www.juniaer.com.br/>

e-mail: juniaer@hotmail.com

www.facebook.com/asaseases.juniaer

Telefones: (35) 9149-8548 (Whatsapp) Elton

www.instagram.com/juniaermodelismo/

(35) 3591-1036 (fixo)

twitter.com/Juniaer

You Tube - JUNIAER