GERONIMO

The Geronimo is the 100" wingspan contest grade electric powered glider. It is suitable for the F5J class with limited wingspan to 100", for ALES and similar classes.

We applied our long-years successful experience with the foam/glass skin flying surfaces. Models with exact airfoil, sharp trailing edges etc. flew much better, than those made of stick and film. The main reason is the overall improvement of the aerodynamic properties.

The foam/skin structure provides also much better rigidity. It allows that the wing A/R can be high. The ailerons and brakes will not warp.
Each half of the wing is made as single part. The polyhedral is built in during the molding process.

The pod can be used for different types of models and equipment. The pod is very slim, yet it provides enough room for power unit parts, RC set, altimeter.

The rear fuselage part consists of carbon/glass boom. It provides long tail arm for excellent flight stability.

The tail feathers are made in similar method as the wings. They are very lightweight.

The CG can be in correct position even with the very lightweight power unit components: Motor Dualsky Xmotor 2826EA-10 without gears and LiPo 2S (weight ca. 75 grams).

The on-board RC system can be supplied from the ESC BEC. The Castle Talon 35 is very good choice. If you use another ESC, check if its BEC can supply the receiver and 6 servos.

When in doubt, use Dualsky VR-3 external voltage controller. It can be supplied from the battery balance connector. In this case, do not forget to interrupt the red wire which is part of the servocable between ESC and receiver.

Specifications	
Wingspan	2540 mm
Length	1410 mm
Empty weight	ca. 490 grams
RTF weight, w. recommended equipment	ca. 780 grams
Wing airfoils	AG 40-43

Recommended equipment for class F5J-100:

- Motor XM2826EA-10
- Prop Aeronaut 9,5x5 – 10x6
- Prop spinner 32/3,2 - pin 8/3
- Accu Dualsky XPower 1200-2S, Hyperion 60 1400-2S HV
- ESC Castle Talon 35
- Rx and servo supply: ESC BEC or (optional) controller VR-3
- Servos GWS PICO BB , ATLAS 09, DYMOND 47, KST X08, MKS 6100 … 6 pcs
- Rx: min. 7 channels
- 4-pin Deans mini red and black with servo extension

The model with above suggested equipment can climb almost 200 meters within 30 seconds.

The model was designed for duration type competitions. It is strong enough for this type of flying. It is not recommended to try high-load aerobatics.

Caution!!! Even if invisible, the wing surface is slightly porous. Any contact with some organic solver (nitro) will attack the foam core! The same pays for the common CA.
We recommend to use epoxy or foam-friendly CA (BSI gold, for example).

Model assembly

Fuselage

The motor mount is already installed. If not (on demand):
The mount provided in the kit suits well for the outrunners of 28 mm o.d. and spinners 32 mm. The sizes of the mount and spinner provide enough room for the motor cables usually used in outrunners.

Cut off the pod tip, so that the opening is of approximately 25 mm diameter.
Adjust correctly the motor mount: Find bolt M8 x ca. 60-80 with nut and screw on into the motor mount central hole. Use the bolt as the indicator of the correct motor axis adjustment: ca. 0-1 deg down, ca. 0-1 deg right. Fix the mount in position with few CA drops. Remove the bolt and secure the motor mount in position with epoxy, around the mount perimeter, from both outside and inside. Be sure to leave the mount (inner) surface clean in the area of the contact with the motor face.
Sand the excess pod tip so that the motor mount is ca. 1-1,5mm deep.
Alternativelly, if you have tube of 1/8" i.d., install the motor to the firewall first, then install the assembly into the pod, put the tube on the motor shaft and check the thrust angles with help of the tube.

Canopy lock: Cut carbon rod 2 mm, about 5 mm longer than the canopy. Round the upper edges. Drop fix in place with medium CA and activator. Secure with a square layer of glass or carbon fiber ca. 20x20mm.

The wing bolt mounting holes are already complete. If not:
Install two hardwood blocks: Shape the top edges of the two hardwood blocks to fit exactly into the pod. Epoxy in position (touch the contact surface of the pod with sandpaper before). It is good idea to insert a layer of fiberglass cloth between the wood and pod surface. Assemble the wing halves and tap together with adhesive tape. Tap the wing to the wing saddle.
Mark the holes centers, drill holes ca 1,5 mm and check for their correct position. If not satisfied, use rat tail file to move the hole center into correct position. Gradually increase the drill dia. and check again. The finished holes are of 3,2 mm dia.
Tap M4.
Complete the two front holes first, screw the wing in position and then repeat for the rear pair.

Trim the cut outs for the servos with very sharp knife to match exactly the servos you would use.

Wing

Test mount the servos in their wells. You can cut-off the servo flanges. Extend the servo cables if necessary. Servocables 0,14mm2 are just fine. Run some suitable tool through the channels and run the servocables with their help. We recommend twisted copper wire for this purpose. Leave about 5 cm to extrude from the wing root. Solder two servocables to the Deans Mini 4pin connector: 2 signals of 2 servos, common +, common -. Same for each wing part, red and black connectors respectively.

Locate the correct position of the movable surface horn. Use very sharp and thin blade to cut the notches for the horns in the movable surfaces. Locate the arms so that they protrude through the parts. **Be sure to epoxy in place the elliptical plate with slots to reinforce the flap horn connection**. Glue the arms in place from both upper and lower surfaces. The epoxy fills the corners what provides for very rigid and firm assembly.
The horns of the brakes must point rearwards, so that the scope of the motion allows for full brake deflection!

Tailplane

We have got excellent experience with the carbon pins, which simplify the assembly and secure perfectly the tail parts in place.

The holes in the boom are already made. If not (on demand):
Make up a simple jig (see images). Drill four pairs of 2 mm holes for the securing pins through the boom.

Mark the positions of the holes on the fin root rib. Drill holes in the fin, deep enough! Sharpen the pins which will be inserted into the foam. BUT do not await the pins would drill any nice hole in the foam! Even if the pin was sharp, it would only crush the foam. Assemble the fin with the boom. Check for correct position, but do not glue yet.

Screw the stab to the stab mount with the plastic bolt, fix its position with 2 mm pins but do not glue them yet.

Place the stab/mount assembly onto the boom, take care to keep right angle veritically and horizontally. Now it is time to fix minor inaccuracies (if any). When correct, just drop medium CA to "pin" the mount and fin in place.

Remove the stab. Glue the stab mount and fin well on the boom, preferably with epoxy. When using CA, be sure it cannot contact the glass covered foam surfaces.

Servos – moving parts connection

Tailplanes
As the tail arm is rather long, it is very important to keep the servo/horn connection as lightweight as possible. The pushrods consist of 2mm plastic tubing and 0,8 mm piano wire.

The pushrods are attached to the servo arms with adaptors 0,8 >M2 soldered on and clevises 23 mm. The moving surface horns are attached with L-bends. For sake of security, leave the bends which are run into the horns rather long, about 10 mm.
If the legs are long enough, it is impossible to get loose.
The L-bend allows for easy detaching the stab, what is very good for the transportation.

Ailerons and flaps
For ailerons we recommend 2 mm aluminium rod, with threads on both ends shown on the web. The rods are included.
The flaps can be loaded during the landings, if you did not close them in time. Here we strongly recommend to place the servo so that its main shaft is REAR. If the flaps are open, the servo arms point forwars, almost parallel to the wing down surface. The goal is to do the torque arm as small as possible.

Moving surfaces deflections
We suppose to program three flight modes: normal, thermal, speed.

Normal: Flaps and ailerons – neutral position, flush with the central part of the wing.
It is ca. 2 deg down in respect to the front wing part.
Thermal: Flaps and ailerons - ca 6 deg down
Speed: Flaps and ailerons - flat bottom airfoil or up to 2 mm up.
The flaps movement must be compensated with elevator, in the same sense: flaps down, elevator down and vice versa.
Note: Make a cardboard templates with tip angles 178 and 174 deg to adjust the flaps deflection.

Typical movements of the control surfaces:
Ailerons ca +10/-5
Flaps: see above

Fin +/- 20 mm
Elevator +/- 5 mm

Butterfly
Flaps 80+ deg down
Ailerons ca 10 mm up
Elevator compensation: ca 2 mm, adjust as necessary

Transmitter sticks: according to the pilot habit. Usually, the motor is controlled by a switch. For the competition type spot landing the flaps (butterfly) must allow for fluent control.

Centre of gravity
The good starting position is ca 90 mm behind the wing leading edge. Usually, the CG is moved rearwards (maybe around 95mm) when you and the model became good friends.

Assembly
BE SURE TO HOOK UP THE ELEVATOR PUSHROD! Hook up first, then screw down the stab. Or/and bend the pushrod wire so that it must be installed first.

Flying

If the CG is in correct position, the model should fly instantly, without problems.
Have a lot of fun.

Note
If the wing is attached with just four M4 plastic bolts, the rear bolts can break during harder landing. It saves the wing in hard landing but can be annoying. Place a piece of adhesive tape (50 mm or so) across the seam, just in front of the rear bolts.

Note
This manual, and pictures of assembly are available from our website www.horejsi.cz

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