

HOT SHOT 3

F5K

Building instructions

Dear customer,

You have just become **owner of** our electric glider Hot Shot 3. Thank you for your decision. The model is new version of our successful Hot Shot. Due its sleek lines and very low overall drag it can fly at high speed and also the glide rate is excellent.

The wing is designed with the set of excellent airfoils AG by Mark Drela.

The structure makes use of properties of modern materials. The result is light and very rigid construction. The weight of the model ready to fly can be as low as about 340 grams. The fuselage is of pod and boom type. The pod is made of Kevlar/carbon composite. The boom is made of carbon/glass composite tapered tube, which is very strong yet light.

When compared with the previous version, the new version is much lighter.

The tailplanes are made of foam and glass. The servos were moved into the pod, between canopy opening and wing leading edge, flat. The servos are connected with movable surfaces via steel spring 0,4mm. The new generation servos allow their installation behind the wing spar.

The mentioned improvements improved a lot the flight performance of the model.

Assembly

You will need:

RC transmitter, at least 5 channels, processor controlled unit recommended.

Micro receiver, at least 5channels.

Electric power unit:

Motor: **we** recommend motor Dualsky XM2212-AG28 (KV2300) of O.D. 22mm. Its weight is 26 grams .

ESC ca 15Amps with BEC (Castle Talon 15)

Folding propeller Aeronaut 7x4 with spinner 30/3mm

4 micro servos KST X06 (KST X08, BlueBird 107, 125, 126, A10 ...)

Power supply: LiPo battery ca 550-2S mAh, up to 34 mm wide, ca 35 grams

The rate of climb with mentioned setup is ca. 7m/s

Note:

It is possible to use 3S battery (400-3S), the rate of climb will increase to 11-12m/s. Note please, that this setup generates current ca 15 Amps, what is beyond recommended range for both motor and battery. It can be used for short time period and with caution.

CA glue, good Epoxy.

Basic modeling tools.

Fuselage

Make up (drill and file out) the aileron servo cable access hole in the wing saddle. This hole serves as the aileron servo cables exit. **The hole should be oval and small**, about 12 x 18 mm. A large rectangular hole would substantially weaken the pod in this area.

Do not glue the boom to the pod in this stage.

Make the canopy lock of carbon rod 1,5 mm. CA glue the lock wire to the hatch in the middle. CA dip glue the lock wire to the hatch in the middle. Do not use CA activator.
Secure with epoxy soaked rectangle of glass cloth.
The epoxy would not adhere to CA activator treated surface !

Plan which servos you use and cut the 2mm ply support rectangle to size. Usually, 12x70mm will do. Prepare the servo board. Drill the holes for screws in all 3 parts (pod, support, board).
Glue the support into the pod. Use some pegs to align the holes. Remove in time, before epoxy is cured.
Attach the servos to the plate with double-side adhesive tape, secure with rings of shrinking tape.
Before the servo assembly is installed, attach the steel lines 0,38mm to the servo arms.

Wing

VERY IMPORTANT: NEVER touch the wing surface with nitrate base solvent or common CA glue. The wing skin is very slightly porous and the solvent would damage the foam core!!! For the same reason do not use common CA glue for the wing assembly. You can use CA BSI Gold line or epoxy.

Because of the kit transport, the wing is supplied in two parts. Mark position of the two mounting screws on the root ribs and make up small half-round notches with rat-tail file. Use good 5 minutes epoxy to glue the wing parts together. The dihedral of each panel is 6 deg. With one wing panel laying flat on the building board, the second panel is supported 155-160 mm at the tip (2x6deg = 12 deg).
Carefully drill the holes to 5 mm dia. The axis of the holes must be perpendicular to the horizontal plane of the model. Use preferably drill press and support both parts of the wing equally. Check for correct fit, file out if necessary. Install two aluminum tubes, trim to length and epoxy in place.

Cut two strips about ca 15 mm wide from the glass/adhesive tape. **Do NOT try to separate the cloth from the tape in this stage!!!**

Soak the glass with thin slow curing epoxy and lay down over the central seam both top and bottom. To secure from excess epoxy, cover with a piece of some common plastic (bag). Press between two appropriate boards and pieces of foam rubber using some weights. After the epoxy sets, remove all of the adhesive tapes.
Make patches from the carbon cloth/adhesive tape according to the pattern (four patches for the wing centre connection). Soak the carbon and lay down over the center/tip connection seam, top and bottom. Press with fingers and attach in place with wide adhesive tape all over the patches. After the epoxy sets, remove all of the adhesive tapes.
Open carefully the 4 mm holes for the mounting screws.

Tail

Horizontal stabilizer:

Horizontal stab is detachable.

Install the elevator horn (epoxy).

Make torsion spring from steel wire 0,5mm. The middle part is 50mm long, both tips ca 15mm. The tips must be 90 deg to each other.

Prepare the torsion spring holes: push a pin into the foam correctly apart. Install the torsion spring. It is good idea to cover the spring tips with fine epoxy layer.

Connect the stab with the stab mount with plastic bolt. Glue to the boom, include the 2 x 1,5mm carbon pins.

Vertical stabilizer:

Install the rudder horn (epoxy).

Make torsion spring from steel wire 0,5mm. The middle part is 50mm long, both tips ca 15mm. The tips must be 90 deg to each other.

Prepare the torsion spring holes: push a pin into the foam correctly apart. Install the torsion spring. It is good idea to cover the spring tips with fine epoxy layer.

Drill holes for the carbon pins. Use drill 1,5mm and turn simply in fingers.

Sharpen the pins so that they can be easily installed in the foam.

Glue to the boom, include the 2 x 1,5mm carbon pins. Take care the vertical stabilizer is perfectly perpendicular to the horizontal stabilizer.

Final assembly

Attach the wing to the pod. Attach the tail assembly. There is some play, wind few layers of adhesive tape on both ends of the pod plug.

Twist the boom on the plug to achieve the perfect wing/stab alignment. Use (slow) epoxy to connect the two sub-assemblies. Use the epoxy close the seam only. The connection will stay flexible.

Aileron servos:

Check that the servos you are going to use are in good condition, without play. Servo replacement is tiring. Open carefully the servo cables outlet in the wing bottom center. Cut-off the servo flanges and servo connector. We recommend to place servos in shrinking tape. Make the tape oversize and, after shrinking, trim with nail scissors. Thus, the servo replacement/repairs would be easy.

Run the servo cables through the channels in wing. Push the aileron servos into the openings in the wing, glue them in position with epoxy or silicone glue.

Install the horns in the ailerons: The horns must protrude throughout the aileron. Make up fillets in all four corners, so that the aileron is "clamped" in between. Use very sharp, thin and preferably new knife blade.

Locate the position of the aileron horns, cut notches through the ailerons, insert the horns and **epoxy** them in place.

Connect the horns with servo arms. The link from servo to aileron must be made without any play.

The extension cable between wing exit connector and receiver can consist of 4-wires, which divide into two plugs to be pushed into the receiver. For example:

1. + both servos
2. – both servos
3. left aileron servo signal
4. right aileron servo signal

Tail servos:

The servos are installed flat on the board.

Make the holes for the servo links exits: use pin first and enlarge the diameter with fine rat-tail file. Locate the holes about 80 mm in front of the horns. After the links are unplugged from the horns, the servo board with servos can be shifted forwards into canopy for service.

Run the links 0,38mm through the fuselage and make the ending so that the length of the line could be changed as needed.

Install the motor, etc.

Install the micro receiver and place over the servos.

Do NOT insert the aerial into the carbon pod/boom as the control range can be seriously decreased!

Check for the correct CG position. It should be 70-75 mm behind the wing leading edge. Move the battery if possible or/and use some weight.

Connect and test all of the RC and power equipment. Only when everything works correctly, install the propeller.

Building images

Can be found at

https://ivanhorejsi.rajce.idnes.cz/Hot_Shot_3/

Control movements

The model is normally equipped with 4 servos: two for ailerons, one for stabilizer and one for rudder.

Ailerons - direction control (measured from neutral aileron position)

12 mm up, 6 mm down

brakes: ca. 30 mm down

flaps: 3 mm down

brakes and flaps should be compensated for with appropriate elevator movements: up elevator for up ailerons.

Elevator

up/down 5 mm

Rudder

left/right 10 mm

Motor

Full gas is usually compensated with small "down" elevator.

These movements can vary according to your personal preference.

Flying

After usual RC range testing, check of the correct movements of control surfaces, correct model set up in the Tx etc. give it full gas and let it go.

For the first flights it is convenient to have somebody to launch the model so that your hand is ready to input elevator control if necessary.

As soon as you find suitable elevator compensations for the motor, self-service make no problems.

We recommend motor switch control and stick brakes control.

Or any other method allowed by your transmitter.

Have a joy with your HOT SHOT 3!

Horejsi model

Czech Republic