

# Q12 X

*The EP glider Q12X is the competition version of our successful Q12. It is supposed to be used as competition-grade model for the class of "small outrunners", which is flown in many countries. The rules include motor of 2826 size, minimum prop size 10", battery 2S, minimum weight 500 grams.*

The foam/skin structure provides very high rigidity. The A/R can be very high. The ailerons and brakes will not warp. The A/R is about same as that of free flight power models. Each half of the wing is made as single part. The dihedral is built in during the molding process.

The pod is very slick, yet it provides enough room for RC and power unit parts. The battery must be lower than ca. 35 mm.

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

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

The on-board RC system is supplied from the ESC BEC. Check if the BEC can supply receiver and 6 servos. When in doubt, use Dualsky VR-3 voltage controller. It can be supplied from the battery balance connector.

Specifications	
Wingspan	2000 mm
Length	1210 mm
Empty weight	from ca. 290 grams
RTF weight, w. recommended equipment	from 500 grams
Wing airfoils	AG 40-43

## Recommended equipment for the class of small outrunners:

- Motor XM2826EA-10
- Prop Aeronaut 10x6
- Prop spinner 32/3,2 - pin 8/3 - pitch of pins 38 mm
- Accu Dualsky XPower 1200-2S
- ESC Castle Phoenix 35, Dualsky XC3012BA-V2, Dualsky XC4018BA-V2
- Rx and servo supply: ESC BEC or controller VR-3
- Servos GWS PICO BB, ATLAS 09, DYMOND 47 and/or 60 ... 6 pcs
- **NOTE: Only DYMOND 47 are low enough to be installed under the wing !!!**
- Rx: min. 7 channels
- 4-pin Deans mini red and black

## Model assembly

### Fuselage

Motor mount installation: Cut off the pod tip, so that the opening is of approximately 25 mm diameter. The mount in the kit suits perfectly for the outrunners of 28 diameter o.d. and spinner 32 mm o.d. The sizes of the mount and spinner allow for enough room for the motor cables.

How to adjust correctly the motor mount: Find a longer bolt ca M8 with nut and screw on it into the motor mount central hole. Use the bolt as the indicator of the correct motor axis

adjustment: ca. 0-2 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 surface clean, in area of the contact with the motor face.

Sand the excess pod tip so that the motor mount is ca. 1-1,5 mm deep.

Bend the canopy mount wire (piano wire 0,8 mm), so that the ends are in the middle of the canopy. The wire should be longer than the canopy, ca. 3 mm on both ends are just fine. Drop fix in place with medium CA and activator. Secure with a square layer of glass fibre.

Epoxy in position ply rectangles (touch the FG with sandpaper before), which make for the wing bolt attachment nuts. Using the wing as template drill holes 3,2 mm a run tap M4: Mark the holes centers, drill holes ca 1,5 mm and check for the correct position. If not satisfied, use rat tail file to "move" the hole center. Only then drill holes 3,2 mm. Complete the two front holes first, screw the wing in position and then repeat for the rear pair.

Assemble the wing and fuselage pod. Assemble the boom/ tail parts assembly – see below.

Make the cut outs in the servo mount to accept the servos you will use. Install the mount and the servos. There is enough space for the Dymond 47 servos, but hardly for other servos. Be sure to install the servos in the rear area of the cut-out in the wing saddle. You will need some space for the wing servos connectors in the front part of the cut-out.

## Wing

**Caution!!!** Even if invisible, the wing surface is slightly porous. Any contact with some organic solver (nitro) will attack the foam core!

Use very sharp and thin blade to cut the notches for the arms in the moving surfaces. Locate the arms so that they protrude through the parts. Epoxy glue the arms in place from both surfaces. The epoxy fills the corners what provides for very firm assembly. The arms of the brakes point rearwards!

Cut off the servo flanges. With servo tester or RC set up neutral servo arm positions. The aileron servos arms point in right angle to the wing bottom surface, the brakes servo arms should point rearwards so that the scope of the motion allows for full brake deflection.

## Tail

We have got excellent experience with the 1,5 carbon pins, which secure the tail parts in place. Drill two 1,5 mm holes for the fin securing pins **throughout** the boom. Mark the positions of the holes on the fin root rib. Drill holes in the fin. Assemble and glue the fin to the boom. Screw the stab to the stab mount with the plastic bolt, fix its position with 1,5 mm pins but do not glue them yet.

Place the stab/mount assembly onto the boom, take care to keep right angle vertically and horizontally. When correct, drop CA to "pin" the mount in place.

Remove the stab and glue the mount on the boom with medium CA. Check again.

Drill 1,5 mm holes through the mount AND boom, install the 1,5 mm carbon pins and glue with thin CA.

Only NOW push and glue the complete tail and boom assembly on the pod. Rotate the boom on the pod, so that the stab is perfectly perpendicular with the wing.

The centerline of the stab airfoil should be perpendicular with the boom axis.

## Servos – moving parts connection

### Tailplanes

As the tail arm is rather long, it is most important to keep the servo/horn connection as lightweight as possible. The weight of the conventional full-length wire/tubing would be higher, that the weight of the boom.

Our solution is to use carbon rod 0,8 mm pushrods, which connect the servo arms with the

tailplane horns. The rods are guided with pieces of white plastic tubing, mounted on the outer side of the tailboom.

Use one pair of the tubes about 130 mm long in the wing leading edge region and another 3 pairs ca. 20 mm long, located evenly along the boom. Another piece of tubing in the stab TE region is necessary to guide the rudder rod. We recommend just to tape the tubes to the boom. Easy, secure.

The pushrod is attached to the servo arm with piano wire Z-bend, while the moving surface horn is attached with L-bend. All is made of 0,8 mm piano wire. The rod is connected with the wire with piece of shrinking tape. Use clean soldering iron tip to shrink the tape. Set up both servo arm and movable surface into neutral positions before. You have few seconds to fine tune the length if necessary, before the tube gets stiff. When satisfied, secure with drop of thin CA.

At worst, cut off the tubing with sharp knife and start again.  
This solution is very reliable and lightweight.

The L-bend on the rudder can be secured with ca. 3 mm of plastic tubing, pressed with pliers and secured with CA drop. The L-bend of the stab cannot move out, as it is close to the fuselage side. However, if the leg is ca 8 mm long, there is next to impossible to get loose. The L-bend allows for easy detaching the stab, what is very good for the transport reason.

Be very careful when apply thin CA close to the rod/tubing. A drop inside can totally destroy your effort. We recommend to drop CA on piece of paper and to apply with toothpick.

### **Ailerons and brakes**

The pushrod is made of Z-bent (servo side) 0,8 mm piano wire and metallic tip, plus plastic fork (horn side).

We prefer 2 mm aluminium rod, with threads on both ends, shown on the web. The disadvantage is that tools to make M2 threads must be used.

### **Moving surfaces deflections**

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

Normal: Flaps (ailerons and brakes) – 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 (ailerons and brakes) ca 6 deg

Speed: Flaps (ailerons and brakes) flat bottom airfoil

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

V-tail +/- 8 mm

Fin +/- 20 mm

Elevator +/- 5 mm

Butterfly (landing)

Brakes + ca 70 deg

Ailerons – ca 10 mm

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 brakes (butterfly) must allow for fluent control.

### **Centre of gravity**

The good starting position is ca 70 mm behind the wing leading edge. Usually, the CG is moved rearwards when you and the model are good friends.

## **Flying**

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

## **Note**

Manual, assembly drawing and pictures of assembly are available from our website  
[www.horejsi.cz](http://www.horejsi.cz)

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