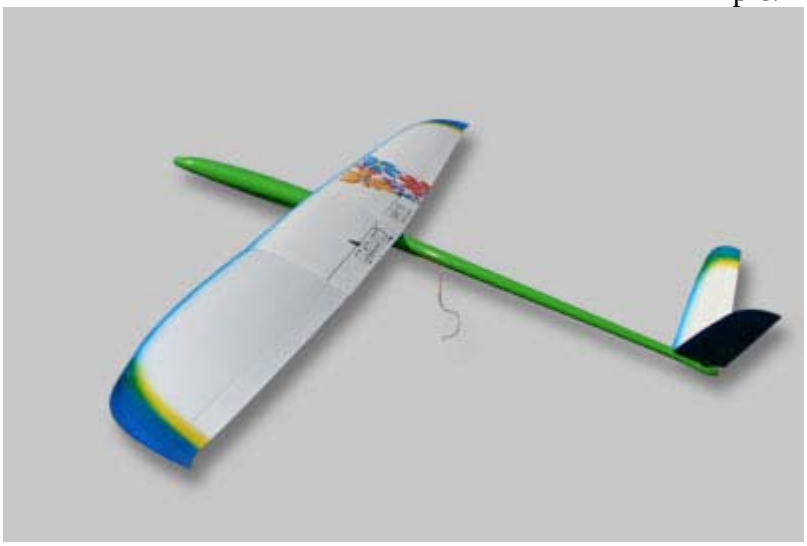
GRAPHITE2 Assembly Guide

Dear model fliers! Vladimir's model is doing his best for you to get the greatest pleasure on each step of communication with our models. We wish you many happy hours of flying with our machines.

pic. 1



Technical data:
Wing span: 3100 mm
Wing area: 64.5 dm
Length: 1515mm
Ready to flight weight (of the test models):
Glass version: 1920 g.
Carbon: 2100 g
F3J extra light version of Kevlar: 1800g
Wing airfoil: MH 32
Stabilizer airfoil: HT14-HT12
Controlling elements: V-form tail, ailerons, flaps

GRAPHITE2 is designed for experienced pilots. Exceptional quality, computer modeling, careful work on aerodynamics, construction designed to combine the extraordinary high strength with minimum weight gives you the feeling of pure pleasure.

This model can be successfully used for different flying types. You can use it as a highest quality glider for slope and thermal soaring on one hand and as an electric HOTLINER.

The experience of previous version helped us to get exceptional controllability and flying stability of the model at critically low speed (e.g. at the landing). This is possible thanks to the flaps area increase, an increased dihedral on the wing's center panel and a new V-tail designed by Dr. Drela.

A slight increase of the dihedral of the wing center panel increases the flying stability and helps you to control the model in thermal conditions on long distance and also increased the effectiveness of the rudder.

Extraordinary wind penetration will allow you to return from the far distant thermal. A special construction of the fuselage which redistributes loads from the nose to the back part when tough landing during the competition. Also, besides the fuselage is strengthened by a layer of unidirectional high strength carbon.

That's why Graphite2 will completely satisfy the experienced pilots ambitions and will surprise the less experienced pilots with it's stable flying characteristics.

Parts of the set

pic. 2

FUSELAGE - color, gelcoated and laminated in the aluminum mould. It's made of Kevlar and carbon and has a removable nosecone. Its keel for the RC mounting is made of carbon together with the ballast mounting tube.

WING - color, three-section gel coated and laminated in the aluminum mould has sandwich construction and is made of the materials according to the version. It has a high-tech carbon spare and joiners. THE AILERONS and flaps are completely ready and hinged. They also have wipers closing up the slot when aileron/flap operates.

STABILIZER - color two section gel coated and laminated in the aluminum mould, has sandwich construction and is made of HEREX and fiberglass. It has a carbon spar and joiners. The elevators are ready and hinged. They have wipers closing up the slot.

ACCESSORIES - screws, horns, clevis, metal plugs wing pushrods, carbon pushrod for the elevator, servos covering plates and tow hook.

Assembling instructions

Please read these instructions completely before assembling the model.

These instructions are recommendations, however you may assemble your mode and combine the equipment your own favorite way.

Please be careful with the wing and stabilizer surfaces when assembling the model and mounting the controlling equipment and controling the model.

ATTENTION!
Do not allow any tools or hard objects to get in contact with the surfaces of your wing to minimize damage!

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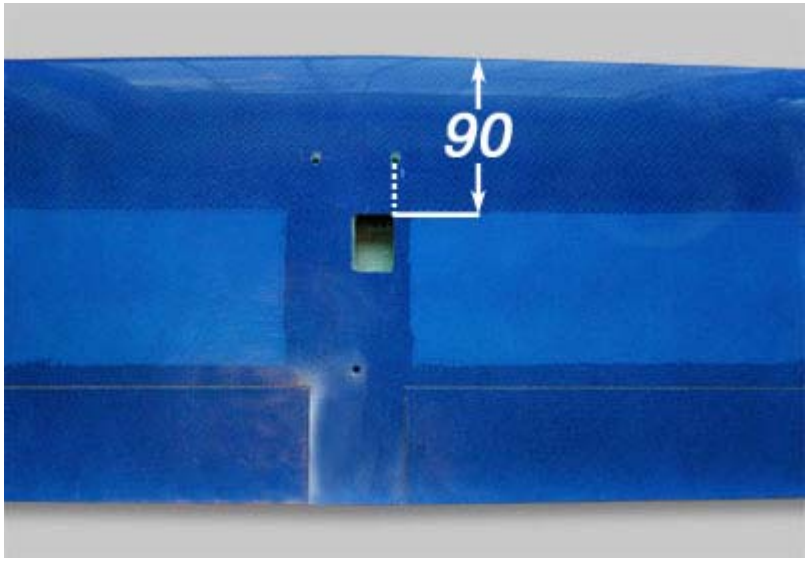
1. Wing

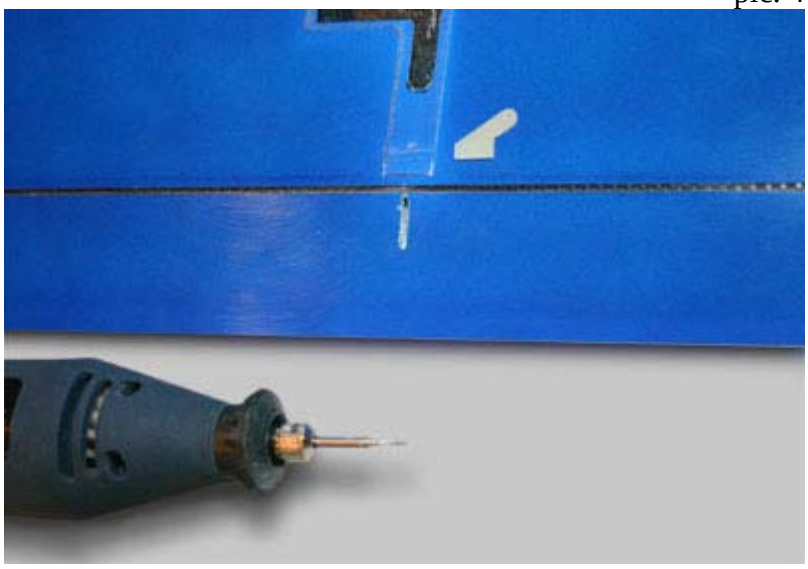
Prepare the wires with connections to install the servos in the wing. Use only high quality wires and connectors.

pic. 3



Make a hole in the wing to install the central connector (don't make a hole in the wing spar, which is situated behind the holes for the wing screw).

pic. 4



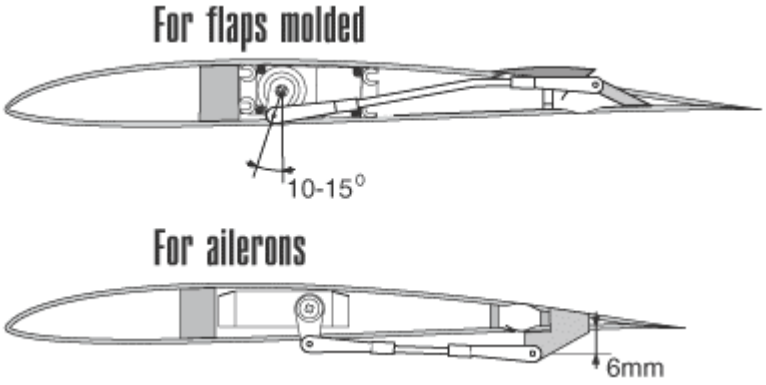
Make slots for the aileron horns (be careful not to drill too deep as to break through the upper surface of the wing).

pic. 5

Insert horn and glue it into the aileron using cyanoacrylate adhesive (as shown at the picture 5).

Screw flap horns in as deep as possible.

pic. 6



ATTENTION!
Be careful no to allow glue to flow into the flap hinges or wing surfaces. Use cyanacrylate accelerator to faster cyanoacrylate curing times!

Before mounting the servos move the servo horns to their neutral position as shown at the picture 6.

ATTENTION!
After the servos have been installed, access to the servo will be limited. Hence, center servos and affix servo horns with screws before gluing these into the wing!

Mount the servos into the wing with the special units for the Volz Micro Maxx servos mounting or glue them with epoxy.

If gluing with epoxy pay attention to the moving parts isolation. Don't let the glue flow in between the moving and fixed parts of the construction.

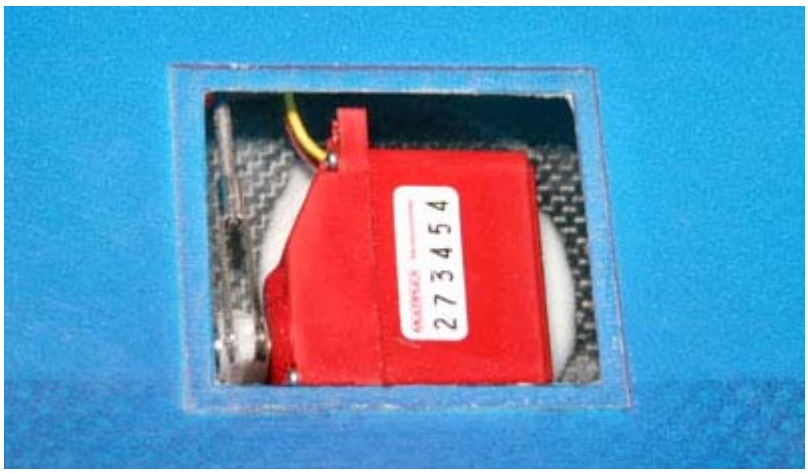
WARNING!
Ensure your wing servos can handle high loads, as surface fludder may develop at high speeds and may likely destroy your model!

Use only high quality servos for your model:

- MPX Micro Speed Digi or JR DS368 for the flaps

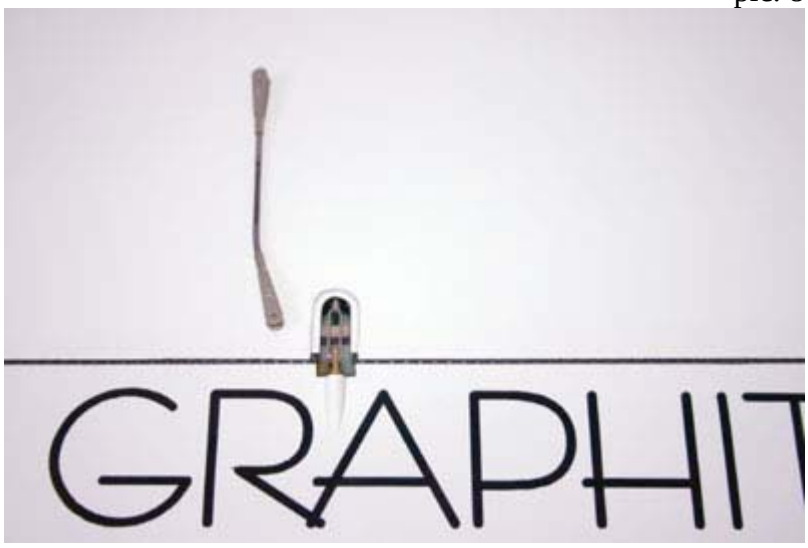
- MPX FL Digi or JR DS368 for the ailerons

pic. 7



After the epoxy has dried, cut the airleron and flap control rods to length. Bend the flaps rods up as shown at the picture 8, to avoid binding on the wing when in use.

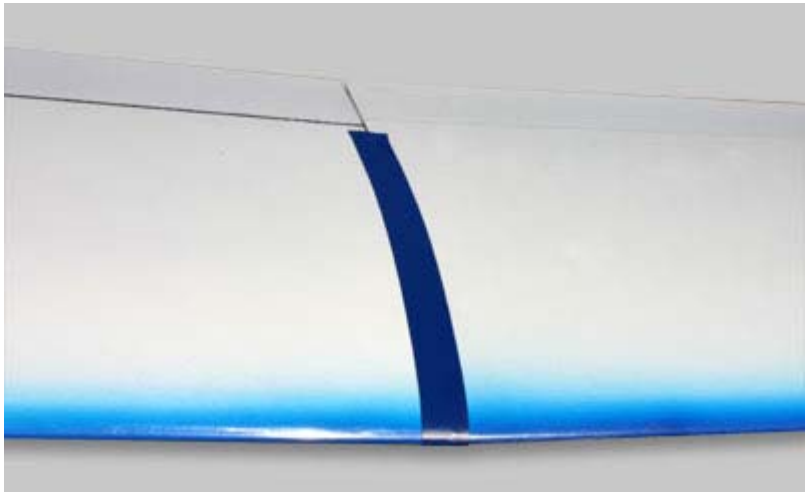
pic. 8



Ensure that the threaded plugs are screwed in completely into the flaps to ensure accuracy duing movement.

Use double-sided tape to install servo cover plate. Work up and glue the small upper well using cyanoacrylate adhesive.

pic. 9



Tape wing tips before flying!

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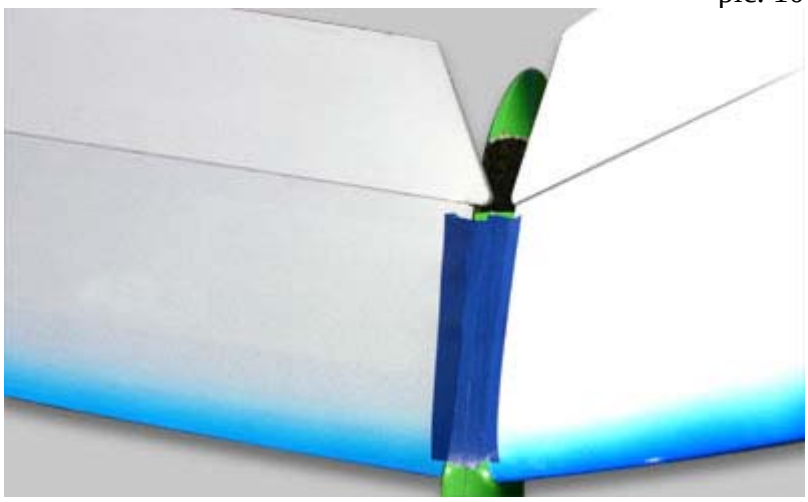
2. STABILIZER

The stabilizer is completely ready and doesn't need any finishing work. Screw in the horns into the holes and affix balljoints using cyanoacrylate adhesive.

pic. 10



Tape stabilizer to fuselage before flying!

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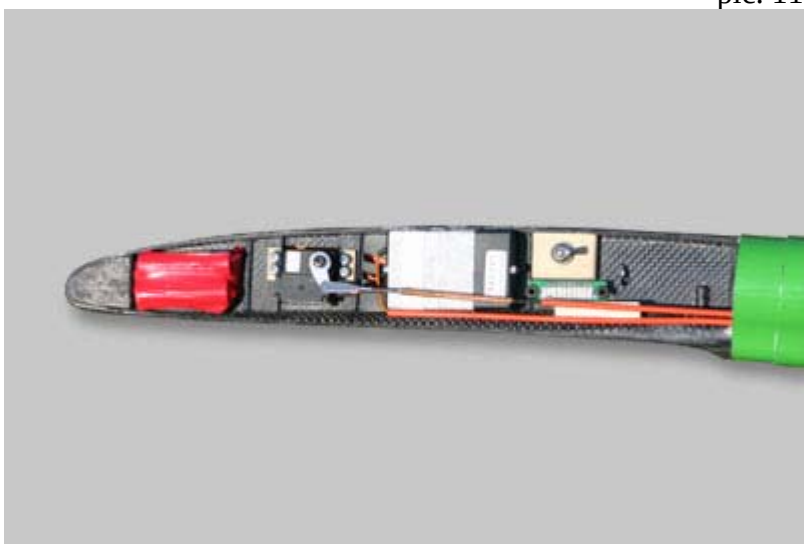
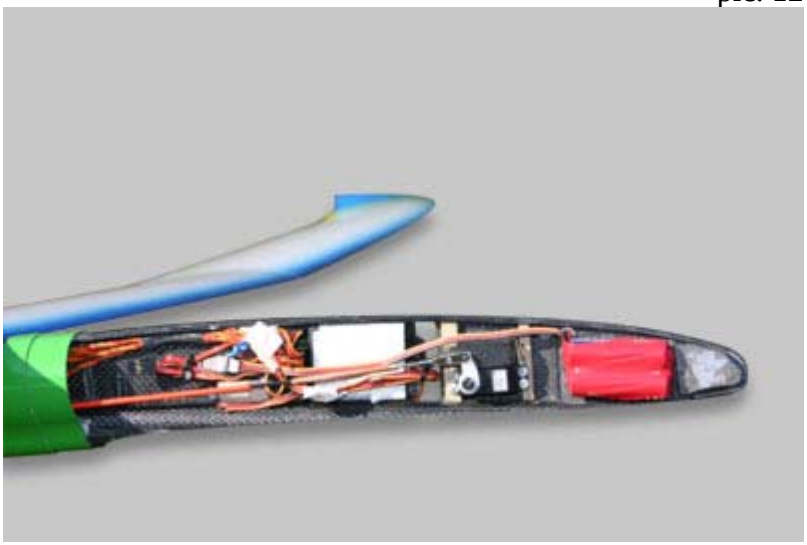
3. FUSELAGE

pic. 11

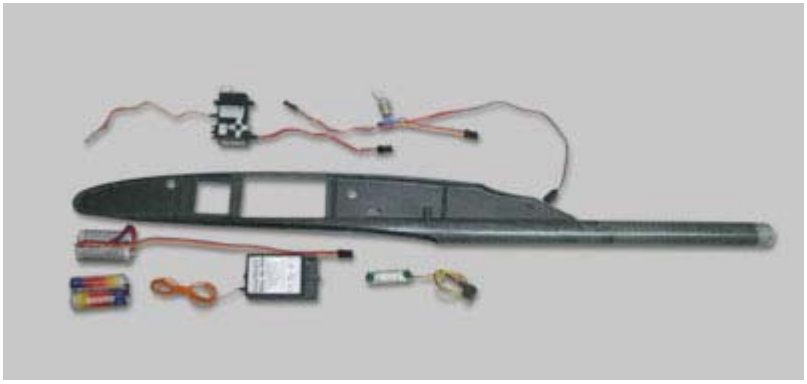


Think about the positions for the servos, the receiver and the battery in the fuselage or use our recommended installation positions.

pic. 12



pic. 13



pic. 14

Glue the plywood bars for servos mounting into the slots. The back slot is wider to make it possible to increase the window if you use bigger servos (max size - 16mm thick e.g. MPX Micro Speed Digi).

Cut the height of the plywood bars to get a 1mm space between the servo horn and the back surface of the nearby servo to fix the plug. Pay attention that the center of the tongue is to be situated between the maximum outstanding both servos parts. Screw the servos and check that they don't contact the nose cone.

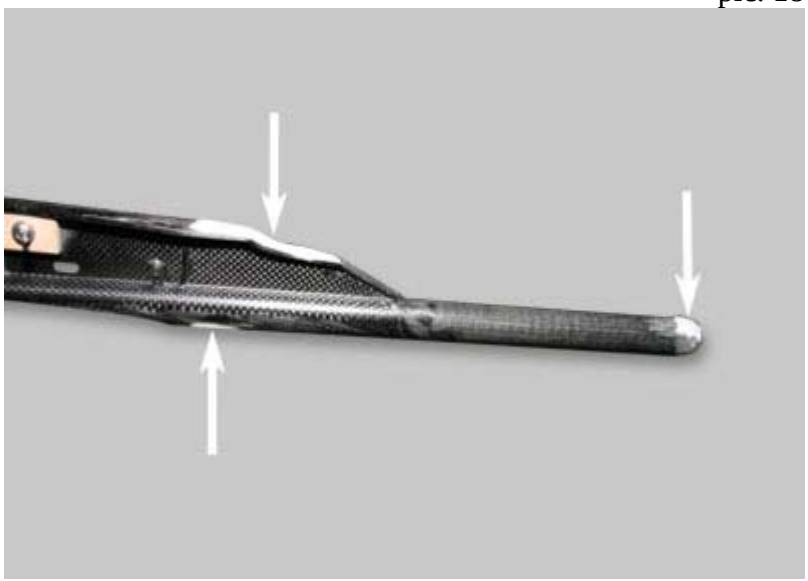
pic. 15

pic. 16

pic. 17

Solder the batteries in pairs. Solder the wire through the tongue and use heat shrink tubing to cover each set of cells. Glue the batteries to the tongue.

pic. 18



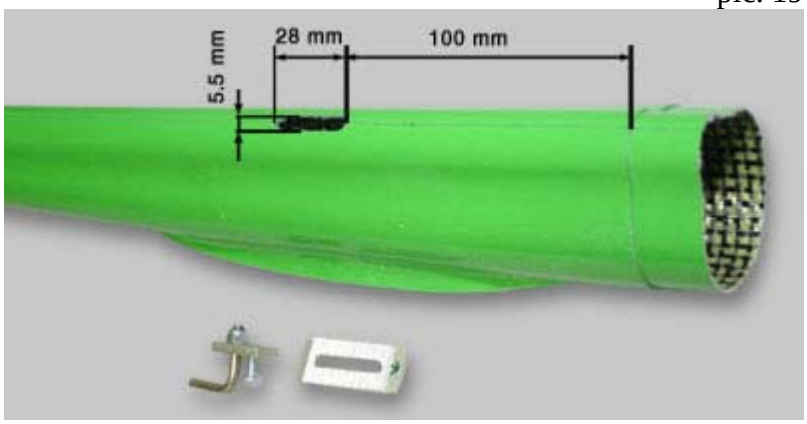
Make the appropriate size hole in the fuselage to mount the tow hook (as shown at the picture 18). For better adhesiveness sand the inner part of the fuselage the gluing spots.

Glue in the tow hook with the epoxy.

After the epoxy has dried cut the part of the tow hook unit flush with the outside of the fuselage.

Screw in the tow hook.

pic. 19



Sand the tongue gluing spots inside the fuselage with sand paper. Paste the epoxy on to the tongue in the spots shown with arrow at the picture 19 and 23, and glue it into the fuselage.

Wipe off any extra epoxy. Check the tongue gluing depth by putting the nose cone on. Pull nose cone off and check if the tongue and fuselage gluing axis coincide. Wipe off any extra epoxy. Use tape to hold the carbon tongue in place until the epoxy has dried.

pic. 20

Make a hole in the fuselage to glue the pushrods pipes as shown at the picture.

Glue the pushrod tip to one side of each rod and screw the ball tips on.

Fix the pipes together in two spots by the glue tape. Put the rods into the pipes and then put them into the fuselage. The pipes are to end at the same point where the stabilizer joiner is. Press the pipes to the lower part of the fuselage and glue them by the cyanoacrylate adhesive through the hole in the fuselage.

Watch carefully to prevent the glue getting inside of the pipe and fixing the rod. For this put the fuselage vertically tail up.

pic. 21

Mount the stabilizer and put the ball rod tips to the horns. Use special instruments to put the ball stabilizer tips on to the horns. You should put the rod out of the fuselage and fix it with some pin (e.g. small screw driver) before putting the horn into the rod tip (as shown at the picture).

pic. 22

Pull the pipe in the servo horn direction and glue it to the ballast mounting tube through the hole at the place of wing fixing.

Cut the rods so that after putting on the tips with the screwed on plugs you could get approximately neutral position of the elevators when the servo horns also have neutral position. Then glue the tips to the rods.

Watch carefully to prevent any glue from getting inside the pipe housing and affixing the rod.

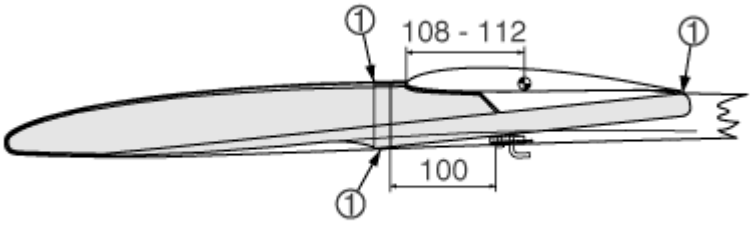
Make several wooden supports for the pipes and affix them as close to the servos as possible. Regulate the length of the rods by screwing the plugs onto them to get the coincidence of the neutral position of the servo horns and the elevators.

Warning!
As carbon is used for the fuselage the receiving antenna is to stand out of the fuselage as close to the receiver as possible. You should fix it to outside the fuselage by the glue tape and pull its end to the V-form tail.

4. CENTER OF GRAVITY (CG)

The center of gravity of the model is to be situated 110mm back from the wing front edge. Install appropriate ballast and glue it in the front part of the tongue.

pic. 23



You can regulate the center of gravity more carefully during the flight according to your flying style.

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5. CONTROL SURFACE ADJUSTMENTS

Ailerons +12-17 mm / -5-10 mm

Elevator +12 mm / -12 mm

Rudder +10 mm / -10 mm

Take off mode (glider version)

Ailerons downwards 5 mm

Flaps downwards 5 mm

Elevator upwards 1mm*

* *Regulate to the maximum, athough the plane should not "dance" at the start*

Landing Mode:

Ailerons downwards 2-3 mm

Flaps downwards 80 degrees

Elevator downwards 3-4 mm**

** *To avoid balooning when flaps are deployed*

Speed Mode:

Ailerons upwards 1-1.5 mm

Flaps upwards 1-1.5 mm

Elevator upwards or downwards 0.5-1 mm***

*** *May vary*

Thermal mode:

Ailerons downwards 0.5-2.5 mm

Flaps downwards 0.5-2.5 mm****

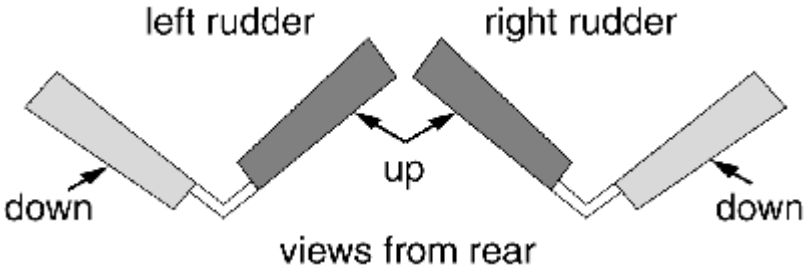
**** *May vary depending on thermal conditions*

Flaps positions relative to the elevator movement:

You can adjust the flaps deviation relatively to the elevator position upwards (but only upwards). It's preferable to be able to switch off this function during the flight.

Turning rudder regulation :

pic. 24



Regulate the deviation of the turning rudder during the flight in order the machine doesn't pitch up or dive when you turn only the turning rudder.

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6. Ballast mounting

You can make a ballast from a metal bar (diameter less than 20.5mm). You can use aluminum (up to

370g), steel (up to 700g), lead (up to 100g) or a heavier metal (up to 1200g).

The ballast center is to coincide with the center of gravity (if of course you don't want to change the center of gravity position when the model is heavier). Fix the ballast by the M3 screw.

WARNING!
As carbon is used extensivly for the fuselage construction, the receiver antenna should exit the fuselage as close to the receiver as possible and be routed along the outside of the fuselage towards the V-tail.

Please be careful and pay attention when building and flying your GRAPHITE2 model. Remember, it is

always easier to check everything before the flight than after the crash!

We wish you many happy flying hours with your Vladimir's model.