

Technical information: VLADIMIR'S Model <http://airplane-model.com> e-mail : sales@airplane-model.com

Building instructions **MINI GRAPHITE**

Dear model flier, we congratulate you on the purchase of your model from VLADIMIR'S Model and wish you many hours happy flying.

Parts included in the kit:

Fuselage : White Kevlar/Carbon with Removable Nosecone

Wing : Two piece Carbon/Glass fibre with carbon spars and wing joiner, ailerons and flaps

Tailplane : One piece fully moulded, integrated elevators

Accessory pack

Parts **not** included in the kit. :

Radio Control equipment: Receiver, Servos, Nicad, and Switch

Servo Mountings, connections and linkages

Motor, Gearbox, Controller, Flight battery, Propeller and Spinner.



Technical Details :

Wingspan	1900 mm
Length	1160 mm
Kit weight	760 g
Profile (Wing)	MH 32
Profile (Tailplane)	NACA 63A 007
Controls	Elevator, Ailerons, Aileron brakes
Optional	Rudder, Aerotow release, Motor,

The Mini Graphite is intended for experienced pilot and builder, providing a compact high performance model of exceptional qualities. This model is a true all rounder, which excels as a high performance glider for the slope of flat field or as an electric Hotliner. Strong, exceptionally light, extremely fast, extraordinarily stable, yet extremely manoeuvrable. The experienced pilot will find the model will fulfil his every demand. The less experienced pilot will find the Mini Graphite will impress with its uncritical flight characteristics.

Building Instructions

1. Degree of pre-fabrication of the model

The White epoxy GRP/CFK/AFK fuselage with a removable nose cone has the wing retainer plates fitted and the retaining screw holes drilled and tapped. The fuselage is ready for the installation of the radio control equipment (and motor on the electric version). The Two piece fully moulded wings have the wing joiners fitted and the wing servo wells formed, the ailerons are ready cut and hinged (elastic flaps) with carbon shrouds on the underside. The one-piece fully moulded tailplane has the elevators cut and hinged (elastic flaps), the elevator horn attachment points are drilled and tapped. The model is finished with a white upper surface to the wings and tailplane with a contrasting darker colour on the underside to aid identification in the air. A short accessory pack including ballast tube, wing servo covers, tow hook (glider version) and control horns complete the kit.

2. Work required to complete the model.

Complete Installation of the radio control equipment and connections to the control surfaces.

Complete Installation of the Electric flight equipment. (Electric flight version)

The model can be decorated to suit your own taste.

Additional parts need be purchased to complete this model. i.e., Materials for the mounting of R/C equipment into fuselage, Electric connections and wiring for servos, R/C equipment, fittings and pushrods to connect the servos to the control surfaces, Electric motor and ancillary electric flight equipment.

3. Building Instructions

Please read all building instructions first before proceeding.

These instructions are for the general guidance of the builder only; please feel free to complete the model using your own favourite methods of assembly or equipment. – Please note our suggestions for wing servo installation.

Care should be taken to protect the surface finish of the wings and tailplane during the installation of the radio control equipment and control linkages. A dirty workbench covered in small screws will ruin your new model.

Note: - Further items will need to be purchased in order to complete this model.

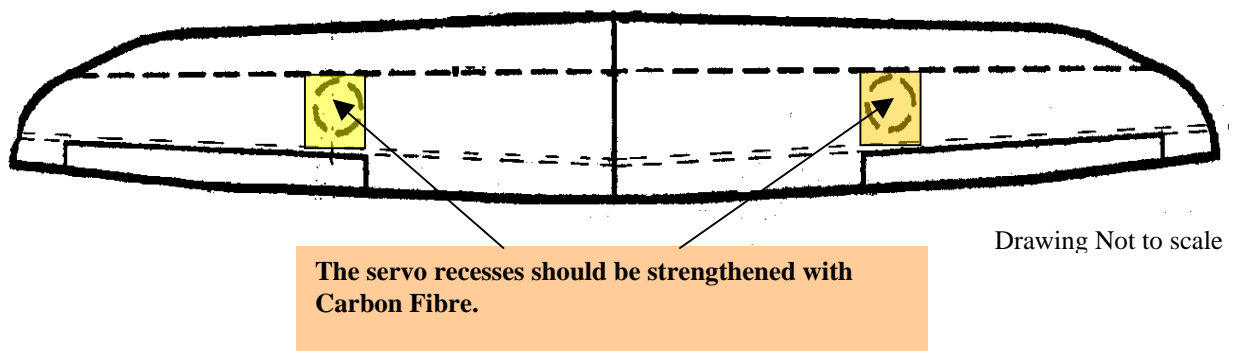
4.) Wings: -

Cut a slot in the underside of each wing half near the wing root to allow the servo wires to exit the hollow wings. Ensure that the holes are positioned over the cut out in the fuselage and clear of equipment in the fuselage. Remember the old saying, measure it twice, cut it once.

5.)

Protect the wing surface from epoxy spills, sticky fingers etc, by covering the wing with kitchen cling film. It is essential that wing servos are mounted onto a solid base on the top wing skin. The top wing skin should not be able to flex under the load of the servo in flight. The servo wells should be lined with Carbon fibre and Glass Fibre Cloth bonded in place with Epoxy Resin. Leave to set overnight. Alternatively a layer of 1.5 mm plywood can be bonded to the top skin.

See Sketches below.

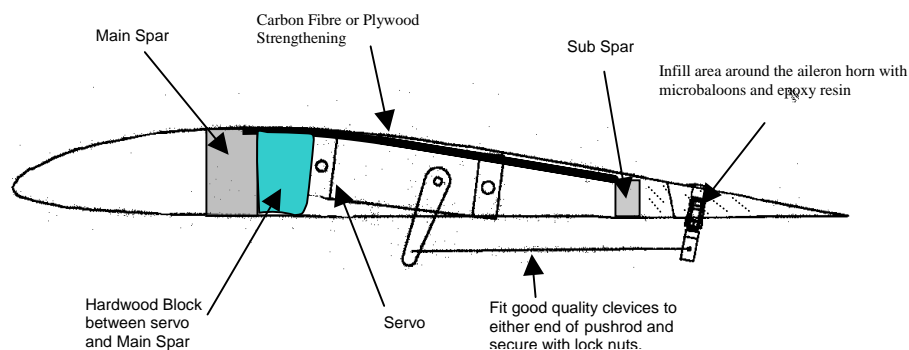


6)

Feed the Aileron servo wires into the hole in the wing centre section, through to the pre formed wing servo wells, and connect to the servos.

Please ensure that you use “High Quality Servos”, that are free of backlash in this model, such as the “Volz Micro Maxx -X”

Prior to mounting the aileron servo's into the wing servo wells, clean any release agent from the Carbon Sheeting inside the servo well using acetone, and abrade the surface to ensure a good bond to the servo Cut the lugs from the servo and roughen the sides of the servo to ensure an adequate bond is achieved. The servo should be positioned rigidly against the spar, if this is not practical, the space between the servo and the spar should be blocked in with hard wood. - This is important in order to hinder servo movement, which could induce control surface flutter. The servo's can then be secured in place using 5-minute epoxy.



7.) Cover the area around the aileron horn with clear tape to protect the surface from damage. Mark off and drill a 4.5 mm holes for the Brass Aileron Horns (supplied). Note; only drill the upper surface at this stage. Ensure the hole is drilled perpendicular to the upper surface of the Aileron. (see sketch). Inject a thick mixture of Microbaloons and epoxy resin into the hole so as to fill the void where the Aileron Horn will eventually fit. Allow to dry overnight. Drill a 4.5 mm hole through the aileron, perpendicular to the upper aileron surface. Bond the aileron horns of your choice to the ailerons, aligning the horn with the servo output arm. We recommend that you fit the Brass Aileron Horns that are available from VLADIMIR'S Model. Fit good quality clevises to the linkage between the servo and aileron horn. The Aileron linkage must be free of play to minimise the possibility of aileron flutter during high-speed flight. Fit suitable plugs and sockets to the wing halves for connection to the receiver

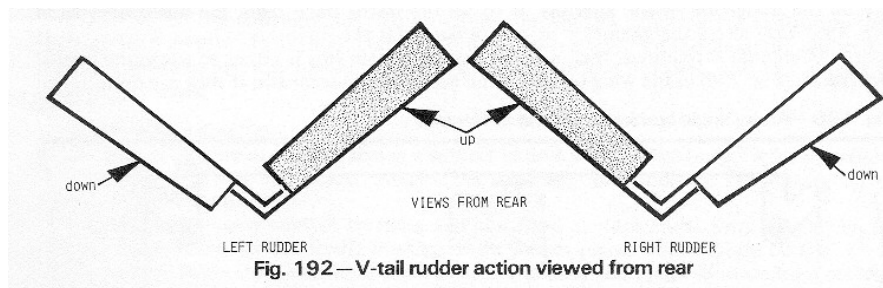
8): Cover the servo cut-outs with suitable servo covers; these should be retained with waterproof tape.

9.) **Vee Tail: -**

Screw the Elevator linkages into the pre-drilled holes in the underside of the elevators. Screw the Vee tailplane to the fuselage with the screw provided. Check that the horn fits in the fuselage neatly and the tailplane will move up and down to its full extent of travel without hindrance.

Connect the servos to the Vee Tail Horns using a nylon-covered bowden snake inner with a steel wire inner or alternatively use 4 mm or 5 mm dia. Carbon Pushrods.

If Bowden's are used they must be securely bonded to the fuselage sides. Failure to do this will result in ineffective control of the elevator surface.



Glider Version

10.) **Fuselage: -**

The Fuselage has a separate nose cone and inner fuselage nose section.

Fit the completed wings and tailplane to the fuselage and tape the rudder and elevator servos, elevator snakes or pushrods, the receiver and the receiver battery to the outside of the fuselage. Check the approximate position of the Centre of Gravity. Lead will probably have to be added to the nose of the model to achieve the CG position.

The completed model should balance between 95 - 102 mm from the leading edge of the wing.

The centre of gravity can only be correctly positioned when the model is flown, as the ultimate position is one of personal choice. Once the correct CG position is determined, bond the lead into the nose of the model.

With 4 servos in the model, for safety reasons it is recommended that you should fit as large a receiver battery as possible.

It is better to carry extra battery power than lead nose weight.



R/C Installation - Glider

Note: - The R/C equipment is mounted on the underside of the inner fuselage; Nicad and Receiver must be secured in place with waterproof tape to ensure that they remain in their correct place when the sheath nose is removed.

Mark the position of the Receiver, Nicad and Servos on the Inner nose. Cut out rectangular slots for each component. Fit the servos by screwing down onto plywood or epoxy board strips placed on the under surface of the inner nose.

The positions of the servos and the Receiver in the inner nose can be reversed from that shown in the photo.

WARNING:- Due to the Carbon fibre in the fuselage, the Receiver antenna must exit the fuselage as soon as possible and run on the outside of the fuselage. Ideally the antenna should be routed away from the fuselage and the end of the antenna fastened to the tip of the Vee tailplane. Ensure that full range checks are carried out prior to launching.

The Tow hook should be positioned approximately 6 to 8 mm in front of the CG. (Adjust to suit personal taste)
 Strengthen the fuselage around the area of the tow hook mounting plate using multi layers of glass cloth and Epoxy resin. Run the glass cloth up to the wing seat area.
 Bond in place a 3 mm thick epoxy board plate to spread the launching load across the fuselage.
 The tow hook and CG positions can only be accurately set by flying the model; they are also a matter of personal taste.

11.) **Recommended Control Movements: -**

The completed model should balance between 95 - 102 mm from the leading edge of the wing.

Ailerons	+ 15 to 20 mm / - 10 to 12 mm
Elevator	+ 10 mm / - 10 mm
Rudder	+ 12 mm / - 12 mm

Launch setting: - Ailerons: - 5 mm down - depending on wind strength
 Flaps : -5mm down

(Glider Version) Elevator: - + 1 mm, Mix in up elevator on successive launches, until model starts to weave on the line, then reduce setting slightly to give a straight launch

Butterfly Aileron: - + 15 mm up
 Flaps: - 70 degree down
 Elevator - 2 to 3 mm - Set to suit, the model should not balloon up when the brakes are applied

Speed: - Ailerons: - Reflex Up + 1 mm to 2 mm,
 Flaps: - Reflex Up +1mm to 2mm
 Elevator -1 down, adjust to suit.

Distance: - Ailerons, flaps: - Neutral,
 Elevator - Neutral.

Thermal: - Aileron: - Down – 1.5 mm to 2 mm,
 Flaps: - Down – 1.5 mm to 2 mm,
 Elevator - Adjust to suit.

Rudder / Aileron Mixing. – (Via Kombi Switch)

Coupled Rudder with aileron can be used for all tasks except Speed Flying; For Speed the coupling should be switched out, preferably as part of the programme in the transmitter.

Additional Instructions for Electric powered model

12.) **Electric Fuselage: -**

An Electric Flight fuselage is available as an optional extra. The wing and tailplane mounting holes are identical to the glider fuselage.

A motor mounting plate is ready fitted to the fuselage nose cone; this will need to be drilled to suit the motor of your choice. As a wide variety of motors can be fitted to the model, the position of the mounting holes will depend on the individual motor used. The Motor mounting plate should be strengthened with an additional 1.5 mm thick epoxy board mounting plate the same diameter as the wooden motor mounting plate, this is epoxied to the wooden motor mounting plate. Strengthen the joint between the mounting plate and the fuselage walls with a small fillet of epoxy resin and glass or carbon rovings. Drill suitable holes in the motor mounting plate to match the motor/gearbox ensuring that the spinner aligns with the fuselage nose.

The layout of equipment within the fuselage is dependant on the equipment used, and should be placed to achieve the required CG position.

The recommended layout of the Electric flight equipment is as follows:-

From Nose to Tail:- Motor, Controller, Flight Battery, Servos, Receiver, Receiver Battery (4 cell).

This keeps the receiver well away from the Electrical noise generated by the motor and reduces the possibility of interference.

Position the electric equipment to achieve the correct centre of Gravity Position. (see previous page)



Electric fuselage with Nose cone removed, showing prop and spinner



Electric fuselage with Nose cone removed
10 x 1250 cells shown



Servo Installation – Electric Fuselage.
If larger batteries are used then the elevator servos may have to be fitted behind wing T/E.

Note:-

Individual installations will vary depending on the weight of the Motor / battery packs used.

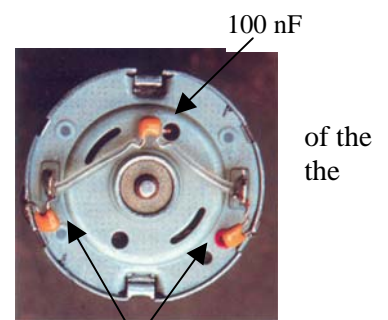
You can mount servo to stabiliser also- It is the best for CG right position.

Note: Before using a speed controller with BEC. Check with the Manufacturer of the Speed Controller to ensure that it is safe to operate BEC with the number of servos fitted to this model. A separate receiver battery should always be used if the number of servos exceeds the manufacturers recommendations, and it is imperative that the red wire is removed from the lead running from the controller to the Receiver.

Follow the maker's instructions regarding Electric motor suppression.

If a separate receiver battery is used it should be placed to suit the CG position. It can be placed behind the Receiver if required but should be mounted on a ply plate, screwed to the fuselage bottom, to stop it damaging the receiver on landings.

Ferrite motors should be fitted with capacitors to reduce electrical interference. Connect a 47 nF capacitor between each of the motor terminals and the outer casing motor and a 100 nF capacitor between the two motor terminals. Ensure the wires of 100 nF capacitor are insulated to prevent shorting out. See photo.



13.) Recommended Control Movements: -

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Elevator + 10 mm / - 10 mm
Rudder + 12 mm / - 12 mm

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Flaps: - 70 degree down
Elevator - 2 to 3 mm - Set to suit, the model should not balloon up when the brakes are applied

Speed: - Ailerons: - Reflex Up + 1 mm to 2 mm,
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Distance: - Ailerons, flaps: - Neutral,
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Flaps: - Down – 1.5 mm to 2 mm,
Elevator - Adjust to suit.

Rudder / Aileron Mixing. – (Via Kombi Switch)

Coupled Rudder with aileron can be used for all tasks except Speed Flying; For Speed the coupling should be switched out, preferably as part of the programme in the transmitter.

14. Motor recommendations

Motor	Gearbox	Prop	Akku	mAh
Kontronik BL 480 – 56 (or 33)	6.7:1	14 * 10	10	1250
Lehner 1525/7	5:1	14 * 10	8 to 10	1250
Kontronik BL 400 – 40	4.4:1	10 to 14 * 6 to 8	7 to 12	From 800
Lehner 1020/14	5:1	9 * 6	10	From 800
Ultra 930	1.8 – 2.5:1-	12 * 7	7 to 10	1250
Speed 500 Race	2.8:1	11 * 8	7 to 8	From 800

These instructions are for general guidance only, please feeling free to complete the model in your own favourite methods.

WARNING !

Due to the Carbon fibre in the fuselage, the Receiver antenna MUST exit the fuselage as soon as possible. Ideally the antenna should be routed away from the fuselage and the end of the antenna fastened to the tip of the Vee tailplane. DO NOT IGNORE THIS WARNING.

We cannot accept any responsibility or liability for damage caused in any way, to property or persons, by the use of our products. It is the sole responsibility of the owner to ensure the safe use of our products. Failure to observe the above could lead to loss of receiver signal and a crashed model, Please ensure adequate range checks are carried out prior to flying the model.

Please fly your VLADIMIR'S Model MINI GRAPHITE in safe manner.
Please remember, it is always better to check before you launch than rebuild after you crash.

We wish you many happy hours flying your VLADIMIR'S Model.