

Building Instructions

Premiant II RC electric-powered glider



Order No. 1317/00



Specification

Wingspan:	2000 mm
Length:	985 mm
All-up weight:	approx. 1100 g

The "Premiant 2" is a good-natured electric glider designed for wind speeds of up to 4 m/sec. The wings feature a modified "E-393" airfoil, which guarantees slow airspeeds and easy handling, making the model a good choice for beginners. The model's major components are supplied factory-built and film-covered; all that remains is to carry out final assembly procedures such as installing the power system, the receiving system and - if desired - spoilers.

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Parts List

1.)	Fuselage, pigmented white	1	GRP, ready made
2.)	Canopy, pigmented blue	1	GRP, ready made
3.)	Rudder, covered	1	Wooden construction, ready made
4.)	Tailplane and elevator, covered	1	Wooden construction, ready made
5.)	Inboard wing panel with spoiler, covered	2 (l + r)	Wooden construction, ready made
6.)	Outboard wing panel with aileron, covered	2 (l + r)	Wooden construction, ready made
7.)	Spoiler and horn, covered	2 (l + r)	Wooden construction, ready made
8.)	Former assembly with snakes and steel inners	1	Ready made
9.)	Tail post	1	Balsa, 7 / 12 x 149 x 5 mm
10.)	Servo plate, two apertures	1	Poplar plywood, 47 / 53 x 67 x 3 mm
11.)	Shaped balsa parts for servo mount	3	Balsa, 10 mm
12.)	Battery support	1	Poplar plywood, 175 x 41 x 3 mm
13.)	Shaped balsa part	1	Balsa, 6 mm
14.)	Balsa former	1	Balsa, 4 mm
15.)	Wing panel joiner, angled	2	Beech, 6 Ø x 56 mm
16.)	Aileron servo well cover	2	Plywood, 41 x 47 x 1 mm
17.)	Spoiler servo well cover	2	Plywood, 44 x 54 x 1 mm
18.)	Wing joiner rod	1	Steel, 5 Ø x 245 mm
19.)	Wing joiner tube	1	Brass, 6 Ø x 65 mm
20.)	Motor bulkhead	1	GRP, ready made
22.)	Rudder hinge	2	Ready made
22.)	Aileron and rudder horn	3	GRP, ready made
23.)	Elevator horn	1	GRP, ready made
24.)	Clevis, threaded coupler and screw	4	Ready made
25.)	Aileron pushrod	2	Steel rod, one Z-bend
26.)	CFRP rod	2	3 Ø x 80 mm
27.)	GRP canopy retainer tongue	2	Ready made
28.)	Spruce strip	2	5 x 2 x 22 mm
29.)	Self-tapping screw	4	1.9 x 6.5 mm
30.)	Nylon screw	2	M3 x 15 mm

Essential items required to build the model

Building board (e.g. 16 mm hardwood board), balsa knife, ruler, straight edge, white glue, screwdriver, 5-minute epoxy adhesive, abrasive paper, modelling pins, paper masking tape.

Recommended RC equipment

- 1.) 4 - 6 servos (9 - 13 g types)
- 2.) Receiver (min. 3 - 5 channels)

Recommended power system

- 1.) Motor: Actro C8 18A
- 2.) Speed controller: Actronic 45 BEC
- 3.) Folding propeller: 14 x 7"
- 4.) Flight battery: 7 NiCd / NiMH cells, or 3S LiPo, 1200 mAh

Wings

- Each wing consists of two panels, which are of traditional built-up construction and are supplied assembled and film-covered. The two panels for each wing are simply glued together; the mating ribs are already set at the correct angle.
- Pin down one inboard wing panel flat on the building board. Slip a small piece of clear plastic film under the outboard facing rib, to prevent the wing becoming stuck to the board.
- Prepare a twisted servo extension lead (not included in the kit), thread it through the inboard wing panel, and into the outboard wing panel.
- Locate the angled dihedral brace, and apply a thin coating of epoxy glue to it and the joint surface of the outboard wing panel. Press the two panels together, pack up the tip at the appropriate angle with a temporary support, and apply tape over the joint to hold the parts together. Check that the two panels are not twisted relative to each other: the rib outlines must line up exactly. Carefully

wipe away excess epoxy on the top surface.

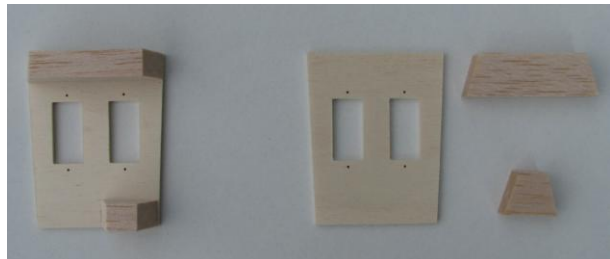
- Allow the glue to cure completely (!), then remove the joined wing from the building board, and remove any excess adhesive on the underside with careful use of a sharp knife.
- Repeat the whole procedure for the second wing panel.
- The next step is to install the aileron servo in each wing: use the tip of a small soldering iron to remove the covering film over the servo well; the hot iron will stick the edge of the film to the structure.
- Solder the aileron servo lead to the twisted extension lead before placing it in the servo well.
- The servo is held in place by the plywood well cover, which is fixed to the wing with clear adhesive tape. An alternative method is to use retaining screws. We do not recommend that you glue it in place, as this would make it more difficult to access the servo in case of damage. Cut a slot in the servo well cover to provide clearance for the servo output arm and aileron pushrod before fitting it.
- Glue the GRP horn in the slot in the aileron - exactly in line with the servo output arm.
- The aileron linkage consists of a short pre-formed steel pushrod, a threaded coupler and a plastic clevis. Repeat the whole procedure with the second aileron servo.

Spoilers?

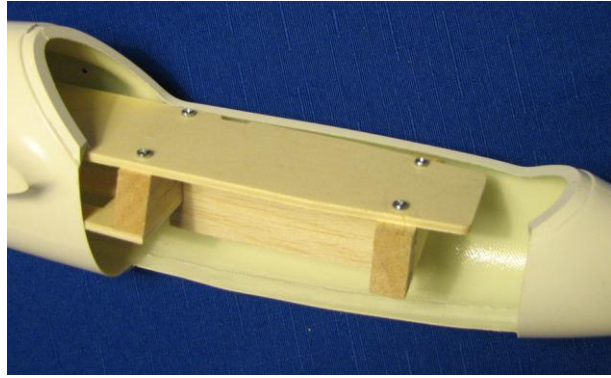
- At this juncture you can decide whether you wish to install working spoilers in your model, although it is also possible to install them once the model is complete. **Tip:** spoilers enable you to carry out steeper, shorter landing approaches, and are also useful for losing height when the lift is uncomfortably strong.
- Each spoiler servo lead should be soldered to a second twisted extension lead before it is installed in the servo well.
- Use high-quality adhesive tape as hinge material for the spoilers (exactly as for the ailerons and the elevator). The spoilers are raised directly by the servo output arms, and closed and held retracted by the steel wire which is already in place; the steel wire is connected to the GRP spoiler horn.
- Take your time over setting up the servo output arm to ensure that the spoilers open and close smoothly and reliably.
- The plywood servo well covers are again held in place using clear adhesive tape or small screws (not included in the kit).

Fuselage

- The first step is to install and align the assembled snake / former unit in the fuselage, working from the front.
- The rudder snake should be routed out of one side of the fuselage, but first you must cut away the channel along the marked lines. Glue the snake outer sleeve to the fuselage at the exit point, then cut it off flush with the fuselage side when the glue is hard.
- Locate the elevator snake outer (with wood block attached) and pull it up inside the fin. Glue it in place in such a way that the elevator can be actuated directly, without any tight bends in the snake.
- The formers can be glued in place by applying drops of epoxy at the joint positions using a length of steel rod or similar as a tool.
- The servo plate is assembled from a set of wooden parts as shown in the illustration. Glue the parts together using thick cyano or white glue, then glue the whole assembly in the fuselage using epoxy.



- The battery support can now be fixed on top of the assembly using four self-tapping screws.
- The wing joiner tube is installed next: start by sanding the surface thoroughly to ensure a sound glued joint. The tube is installed in the rear of the two large holes. Before applying glue, offer up both wing panels and check that the top of the airfoil is aligned neatly with the wing root fairing on the fuselage. If there is a slight discrepancy, adjust the holes to suit.
- Epoxy the brass tube in the holes, applying plenty of epoxy on the inside of the fuselage.
- Drill a hole just aft of the joiner tube in both sides of the fuselage, and file the holes out to form slots, through which the aileron and spoiler servo leads can be passed when the model is rigged.
- The wing incidence pegs take the form of two short 2 mm Ø rods which are glued in the pre-drilled holes in the root facing ribs. Drill matching 2 mm Ø holes in the fuselage to accept the rods. Check carefully that the wing roots line up accurately with the root fairings.
- The wings are retained on the fuselage using strips of clear adhesive tape which are applied on the top surface along the separation line.



Tailplane

- You will find pre-drilled holes in the tailplane for the retaining screws. Remove the film over the holes, position the tailplane accurately on the saddle, and mark the hole positions on the top of the fin.
- Cut an M3 thread in both holes in the fuselage using a suitable steel machine screw: this is accomplished by drilling 2.5 mm Ø pilot-holes, and cautiously driving the screw into the holes. Remove the screws and apply a small drop of thin cyano to each hole to harden the threads. Allow the glue to cure fully before fitting the retaining screws!
- The tailplane can now be attached to the fuselage using two nylon screws.
- Glue the small GRP horn in the slot in the elevator, and check that it is possible to connect the snake inner: glue a threaded coupler to the end and screw a clevis on it. You may need to shorten the snake outer sleeve in order to obtain sufficient down-elevator travel.

Rudder

- Glue the tail post in the tail end of the fuselage, keeping the edges flush.
- Insert two hinges in the tail post and secure them with small wire pins pushed through the fuselage / fin and the hinges.
- Complete the linkage by gluing a GRP horn in the rudder, soldering a threaded coupler to the end of the steel pushrod, and screwing a clevis to the coupler.

Canopy

- The canopy is detachable, allowing the flight battery to be swapped quickly and easily during a flying session.
- Glue the two GRP tongues to the inside of the canopy in such a way that the moulding can be removed by sliding it forward, and then back.
- Alternative methods of fixing the canopy are adhesive tape or a pair of small self-tapping screws.

Installing the motor

- Saw off the fuselage nose at a point about 40 mm aft of the extreme tip. It is important to use a fine-bladed saw, and to cut at right-angles to the fuselage moulding seam. Take care not to squeeze the fuselage out of shape when using the saw. If you have a small rotary cutter, this is the best tool for the procedure.
- Glue the GRP motor bulkhead in place with about 3° downthrust and 1.5° right side-thrust. The simplest method is to fit a machine screw or similar aid into the bulkhead, and use it to pull the bulkhead forward into the fuselage nose from the front. Secure the bulkhead with a little thin cyano, check the angles, then reinforce the joints with plenty of epoxy.
- When the resin has set hard, fit the spinner on the motor output shaft, and sand back the fuselage

nose until it lines up correctly with the spinner. Work slowly and check often - you will be rewarded with a perfect result.

- Now install the motor and connect it to the speed controller, taking care to maintain correct polarity. It is best to check the direction of rotation of the output shaft before installing the motor. You will find it easier to check the direction of rotation if you push a small block of wood on the shaft, drilled centrally to suit the shaft diameter. **Do not use a propeller - injury hazard!**
- Install the folding propeller, hub and spinner as described in the manufacturer's instructions.

Receiving system

- Install the servos in the servo plate, and connect the steel pushrods to the output arms.
- We recommend that you permanently plug short extension leads into the receiver, as this makes it much easier to connect the aileron and spoiler servos. Mark each lead carefully, indicating which servo is connected where, so that there is no chance of mixing them up when you rig the aircraft.
- Install the receiver, and secure it with foam packing.
- The speed controller should be placed on the opposite side of the vertical balsa plate. It **must not** be packed in foam, as this would cause it to overheat in flight.
- The final stage is to screw the battery support to the top of the sub-structure.
- Adjust the position of the flight battery to obtain the correct Centre of Gravity (**68 mm from the root leading edge**).
- Fix the battery in its final position using Velcro (hook-and-loop) tape.



Adjustments

- First switch the transmitter on, and then the receiver. Check that the throttle stick is at the STOP position.
- Check the control functions: the rudder travel should be 20 mm to left and right of centre; the elevator requires 8 mm up-travel and 8 mm down-travel. Check and check again that all the control surfaces move in the appropriate direction, i.e. that "left stick" really does mean "left rudder", etc.
- The correct aileron travel is 10 mm up and 5 mm down. For a right-hand turn (right stick) the right-hand aileron must deflect up, the left-hand aileron down.
- Finally check the power system: **caution - the spinning propeller represents an injury hazard!**

First flight

- If everything is in order, there is now nothing to stop you carrying out the model's first flight. However, we urgently recommend that you join a model flying club and ask an experienced model pilot to help you: he will carry out the initial test-flights for you, and then help you to learn the art of model flying step by step.
- It is also possible to learn to fly without outside help: first wait for a day with little or no breeze. Launch the model with a firm push forward into any wind, keeping the wings and fuselage level. Allow the aircraft to climb at a shallow angle, initially using the elevator only to adjust the rate of climb. Don't let the model slow up too much. If it turns to one side, move the rudder in the opposite direction to return to straight flight.
- Once the model is at a safe altitude, switch the motor off and allow it to glide. Use the controls very gently at first until you feel familiar with the aeroplane's response to commands. Don't get over-confident too quickly, and maintain plenty of height at all times - model flying is a sophisticated skill which needs to be learned, just like driving a car or riding a bike.
- Always land the model with its nose pointing directly into wind. Let it glide towards the ground at a shallow angle, and don't apply up-elevator until it is just about to touch down. Never carry out any major corrections with the rudder when the model is close to the ground!

Safety notes, hazard warnings

- Model flying is a fascinating hobby. However, when flying a model aircraft we urge you to observe the following basic rules, as this will avoid annoying and endangering anyone else.

- When operating any model aircraft you bear the full responsibility for your actions and for any consequences they bring. For this reason you should take out special model flying insurance.
- In Germany you are only permitted to fly model aircraft using a 35 MHz radio control system. The equipment must be registered with the German Federal Telecommunications Office (BABT).
- Your model should only be flown at a site where you will not annoy or endanger anyone; it is always best to use approved model flying sites.
- Never fly towards or over spectators. Keep any high-risk flying manoeuvres well away from other people.
- Never attempt to repair your radio control system; always leave such work to the experts. Any home modifications to your RC system inevitably invalidate its official approval.
- Do not switch your transmitter on until and unless you have ensured that you will not cause interference to any other radio control systems in the vicinity; typically through a “channel clash” (two transmitters on the same frequency).

Please note: if damage ensues due to failure to observe these instructions, the guarantee is rendered invalid. We accept no liability for consequent damage which results from such actions. Please follow the building instructions to the letter when completing and operating this model. The building instructions include information on safe flying. This model is in no respect a children’s toy.

All of us in the aero-naut Modellbau team hope you have many hours of fun with your “Premiant II”!