

Building instructions

Aero-Master RC electric glider



Order No. 1318/00



Specification:

Wingspan:	2480 mm
Length:	1260 mm
Wing area:	44.2 dm ²
All-up weight:	1700 g
Motor:	actro C5, C6 or CL5
Flight battery	8 NiCd / NiMH cells, or 3 - 4 LiPo cells

RC functions:

Elevator
Rudder
Ailerons
Throttle

“aero-naut” Modellbau
Stuttgarterstr. 18-22
D-72766 Reutlingen
Germany

<http://www.aero-naut.com>

The "Aero-Master electric-powered glider is based loosely on the legendary "Aerofly". With its more modern "MH-32" wing section the model is now capable of higher airspeeds, while the GRP fuselage features a motor pylon which allows the use of propellers up to 9.5" in diameter. Either two-bladed or three-bladed propellers can be used. The wings are of built-up construction with balsa sheeting. They are supplied in the kit as bare pre-built structures with factory-fitted joiner sleeves.

Parts List

- 1.) Fuselage and motor pylon: white pigmented GRP
- 2.) Wings: four-part, balsa / spruce construction, factory-assembled
- 3.) Tailplane and elevator: balsa construction, factory-assembled
- 4.) Rudder: balsa construction, factory-assembled
- 5.) Fin post: balsa
- 6.) Snake outer sleeves for elevator and rudder, inner sleeves and threaded couplers
- 7.) Servo well covers: one pair, vacuum-moulded
- 8.) Canopy: vacuum-moulded, ready made
- 9.) Motor compartment cover: vacuum-moulded, ready made
- 10.) CFRP dihedral braces
- 11.) Servo plate, 60 x 80 mm, plywood
- 12.) Servo plate brace: spruce strip
- 13.) Battery plate: 160 x 45 mm, plywood
- 15.) Battery plate half-formers: machine-cut plywood
- 13.) Snake supports: balsa strip
- 14.) Half-round canopy former: machine-cut plywood
- 15.) Support plate for canopy, 70 x 50 mm, balsa / plywood
- 16.) Motor bulkhead, machine-cut GRP
- 17.) Wing joiner sleeves: brass tube
- 18.) Wing joiners: steel rod
- 19.) Small items: hinges, clevises, miscellaneous items
- 20.) Reduced-scale plan: paper
- 21.) Building instructions: paper

Accessories required to build the model

Building board (e.g. 16 mm blockboard), balsa knife, ruler, straight edge, white glue, screwdriver, 5-minute epoxy, abrasive paper, pins, clothes pegs, paper masking tape, covering material.

Recommended RC equipment

- 1.) Four servos (approx. 13 g)
- 2.) Receiver (min. four-channel)
- 3.) "actronic" 45bec speed controller (Order No. 7002/51)

Recommended motors for eight-cell operation (NiCd / NiMH)

- 1.) actro C5 27A (Order No. 7002/35) with 9 x 5.5" two-blade folding propeller, approx. 39 A / static current
- 2.) actro C5 29A (Order No. 7002/35) with 9 x 7" two-blade folding propeller, approx. 46 A / static current
- 3.) actro C6 23A (Order No. 7002/36) with 9.5 x 5" three-blade folding propeller, approx. 30 A / static current

Recommended motor for three LiPo cells

- 1.) actro CL5 26A (Order No. 7001/05) with 9 x 7" three-blade folding propeller, approx. 35 A / static current

Recommended motor for four LiPo cells

- 1.) actro CL5 37A (Order No. 7001/05) with 9.5 x 5" three-blade folding propeller, approx. 45 A / static current

The wing

- Each wing half is assembled from two parts, reinforced with a CFRP rod dihedral brace. The dihedral angles are built-in as standard.
- Lay one inboard wing panel flat on the building board and pin it down to prevent it shifting. Slip a small piece of clear plastic film under the outboard ribs to prevent the structure becoming stuck to the building board.
- Draw the aileron servo lead through the wing: use a length of snake sleeve as a tool for pulling the cable through, and tape the end in the servo well.
- Glue the outboard and inboard panels together using epoxy, gluing the CFRP dihedral brace in place at the same time.
- Pin the panels together, checking that the tip panel is not twisted relative to the inboard one: the rib shapes must line up exactly. Carefully wipe away any excess epoxy that is squeezed out.
- Allow the glue to cure fully (!), then remove the wing panel from the building board and remove any hardened epoxy at the joint line using a sharp balsa knife.
- Carefully sand the joint areas smooth.
- Saw through the ends of the aileron so that it can be removed and hinged.
- We recommend that you cover the wings with iron-on film. The film can then double as the aileron hinge.

- The aileron servo can now be installed: first solder the extension lead to the servo lead carefully. Check that the servo output arm is at the electronic centre position. Check the direction of rotation of the servo at the same time. When you are satisfied, glue the aileron servo in place with a little 5-minute epoxy.
- Alternatively the servo can be screwed or glued to a thin plywood plate, which is then fixed in the wing using four small screws. Section B-B on the plan shows this option.
- Make up the aileron linkage using the horn and linkage components supplied. Take care to produce a straight linkage with minimal slop.
- Cut the servo well cover to shape and tape it over the servo well.
- Screw the wing band retaining hooks in the root ribs.
- Repeat the whole procedure for the second wing panel.

The fuselage

- The GRP fuselage is supplied virtually finished, and only needs to be fitted out. Roughen the inside of the moulding with abrasive paper at all joint positions before reaching for the epoxy.
- Drill the holes in the wing root fairing for the brass wing joiner tubes and the wing root hooks, and slide the brass tubes into place. Plug in the wing panels and check that they fit snugly against the wing root; the airfoil must line up correctly with the fairing. Carry out any trimming required.
- Roughen the brass tubes with coarse abrasive paper to provide a mechanical “key” for the glue.
- Epoxy the brass tubes in the fuselage, and allow the resin plenty of time to cure fully.
- Cut an opening for the servo extension lead in the root fairing. One option is to glue a socket directly in the root fairing, so that the ailerons are connected automatically when you plug in the wings.
- Saw out rectangular openings in the servo plate to suit your servos, and glue the plate in the fuselage as shown in the drawing.
- Now draw the snake outer sleeves into the fuselage and glue them in place as shown in the drawing. Support the elevator snake with pieces of balsa strip to prevent it moving about.
- Glue the fin post in the trailing edge of the fin.
- When the model has been covered, attach the rudder to the fin post using the two hinges supplied. Secure the hinges with epoxy after applying a drop of oil to the pivot pins to prevent them jamming.
- Complete the rudder linkage using the horn and clevis.
- Cover the tailplane with iron-on film and attach the elevator using an adhesive tape hinge.
- Screw the tailplane to the top of the fin, and check that it is aligned correctly with the wing. You may need to adjust the support surface on the fin using a flat file. If you have to do this, take care not to alter the longitudinal dihedral.
- Complete the elevator linkage using the horn and clevis (see drawing).
- Now screw the servos to the servo plate and complete the linkages at the front end. Glue the snake outer sleeves to the balsa strip close to the servos. Keep the linkage runs as straight as possible.
- Assemble a battery support from the two semi-circular formers and the plywood plate, and epoxy it in the fuselage. The battery is best fixed to the battery support using Velcro tape.

The canopy

- The canopy is removable, so that you can easily swap batteries at the flying field.
- Carefully cut out the canopy along the marked line, using a small pair of scissors. A pair of nail scissors works well, but special modelling Lexan shears with curved blades are even better.
- The vacuum-moulded plastic canopy can now be glued to the plywood base plate (see drawing).
- Fit a self-tapping screw in the fuselage at the front, so that the front end of the canopy can be trapped under the screw-head. File an open-ended slot in the canopy to accept the screw.
- Glue the semi-circular former in the rear end of the canopy. Glue the canopy latch in the fuselage using 5-minute epoxy, and drill a suitable hole in the canopy (see drawing).

Motor installation

- The GRP motor bulkhead is pre-drilled to suit the recommended “actro” motors. Transfer the holes to the GRP fuselage and cut them out. The motor downthrust and sidethrust are preset; the settings have proved correct over many test-flights.
- Glue the bulkhead in the motor pylon from the inside, lining it up carefully with the holes.
- Now screw the motor to the motor bulkhead from the inside.
- Assemble and fit the folding propeller as described in the instructions provided by the manufacturer.
- Cut away the front face of the motor pylon (see drawing); this opening is important for motor cooling.
- Connect the speed controller and install it in the fuselage. Take care that none of the cables is under strain.
- The motor cover is supplied as a vacuum-moulded part; trim it to final size and fix it to the motor pylon using four small screws.

The settings

- Check the control surface travels: the rudder should deflect 30 mm to either side of centre. The elevator travel should be 10 mm up and 7 mm down. The ailerons should deflect 11 mm up and 7 mm down.
- Check that the power system works correctly. **Caution: the spinning propeller is an injury hazard!**
- Set the Centre of Gravity to the correct position (**72 mm from the root leading edge, see plan**). When you have established the correct position for the flight battery, fix it in place with Velcro tape.

Safety notes, awareness of danger

- Model building and flying is a fascinating hobby. However, it is important to avoid annoying and endangering other people, so we recommend that you keep to the following basic rules when operating any model aeroplane.
- When you are flying a model aircraft you are personally responsible for your behaviour and any consequences of your actions. For this reason it is really essential to take out special model flight insurance cover. Your best bet is to join a local club and take out the block insurance usually offered as part of membership, or to join your national model flying association.
- In Germany you are only allowed to fly model aircraft using radio control equipment operating on the 35 MHz band, but this may not apply in your own country. Ask your local model shop, model club or any fellow-modeller for information on this. You may also need to buy a licence to operate your equipment.
- Fly your model only at sites where your activity will not annoy or endanger anyone; preferably a model flying site operated by a properly organized club.
- Never fly directly towards or above spectators, and do not be tempted to try dangerous or audacious manoeuvres in their vicinity.
- If your radio control system requires repair, have the work done by an approved technician. Carrying out any work on your equipment yourself invalidates the official approval of your RC system.
- Don't switch on your transmitter until you have established that you will not cause interference to any other RC systems in the neighbourhood; for example, two transmitters operating on the same channel will interfere with each other.
- If possible please join a model flying club, where you will find plenty of helpful modellers who will be happy to answer your questions.

Please note: if the model is damaged due to your failure to observe these instructions, we will not consider any claim under guarantee. We accept no liability for consequent damage resulting from your model flying activities. Please take the trouble to read the instructions for building and operating the model, and follow them as accurately as you can. Part of the instructions cover the safe operation of your model. Please remember that this model aeroplane is by no means a suitable toy for children.

All of us in the aero-naut Modellbau team hope you have many hours of pleasure building and flying your "Aero-Master".