Albatros DII 24″

R/C Scale Model Instructions

CONTACT INFORMATION
The Albatros DII 24″ was designed by M.K.Bengtson
Prototype Built by Edi Werner

Manufactured and Distributed by:

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Albatros DII

Thank you for purchasing the Albatros DII model for electric flight.

THE MODEL

A semi scale adaptation of the Albatros DII, this model is designed to be easy to build and exciting to fly.

SPECIFICATIONS

More than 235 laser cut parts

Scale:	1/14
Channels:	R/E/A/T
Wingspan:	24"
Wing Area:	196 sq in
Power System:	GWS S1 IPS
Prop:	8x6 prop, or a cut off 9x4.7 prop
Wheels:	**B**alsa & plywood, Neoprene foam tires
Airfoil Type:	**F**lat bottomed
Cowl:	N/A
Weight:	7 oz ready to fly
Spinner:	**B**uilt up foam and fiberglass
Decals:	Available on website
Covering:	Litespan or Polyspan

BUILDING THE MODEL

Before Starting

A note about the photos: The photos were taken of a prototype and the parts supplied may look slightly different from them. However, the concepts illustrated are the same.

WINGS

Wing Construction

Pin down, over the plan, the t/e, spars and wing tip, gluing as required. Add the leading edge stock. Leading edge stock is made from balsa provided in the kit. Laminate two pieces to form a length of square stock.

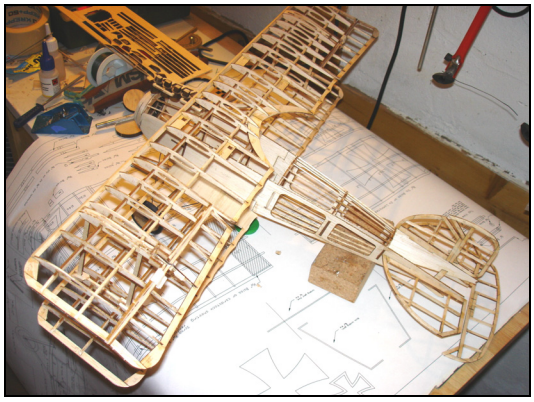
Add the wing tips and align the front tip along the center of the leading edge. Sand the leading edge stock to be rounded and meet the ribs.

Laser cut 1/16″ balsa trailing edge stock is provided with a scalloped shape.
Balsa spars are also included in the kit.

Note: use only balsa strip stock that has been cut on both sides from the kit. The material from the edge of the laser cut sheet does not necessarily have the proper dimension.

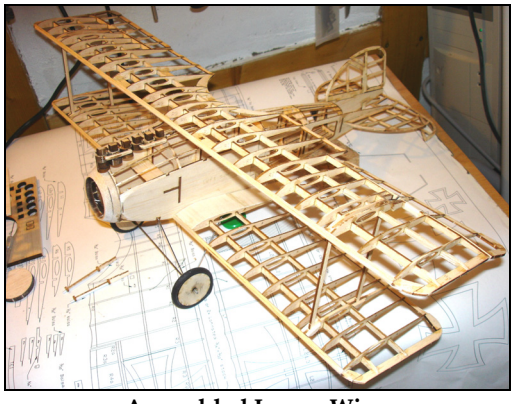
The IP mounting slots should be reinforced with scrap balsa to facilitate a strong joint and provide a place to anchor the covering.

Due to variation in the thickness of the wood, spars and formers may not fit tightly into slots. This is an unavoidable consequence of today's inconsistent balsa quality. If gaps appear in the dry fitting of the parts, thin paper can be used to fill the gaps and make tight joints.



Assembled Upper Wing

The ailerons are pull-pull type controlled. A plywood control horn is provided in the kit. The trailing edge of the top wing has a notch designed for the control horn to move through. The leading edge of the aileron is bevel sanded with sandpaper to make the aileron movable and top hinged. The trailing edge of the wing in that section is left flat.



Assembled Lower Wing

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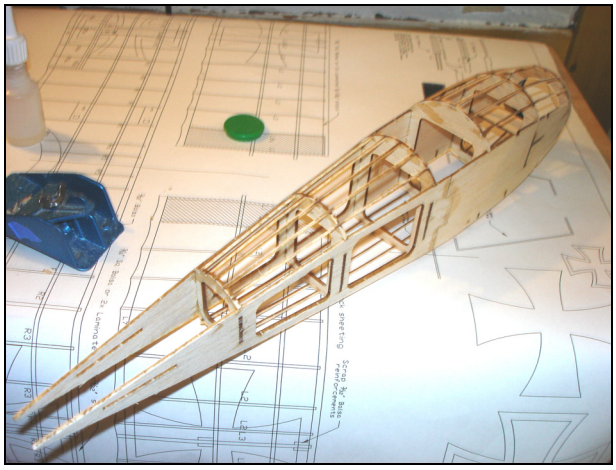
Use 1/32″ balsa or paper cardstock to sheet the bottom root rib area.
Extend the balsa spars to form locating tabs for attachment to the fuselage.

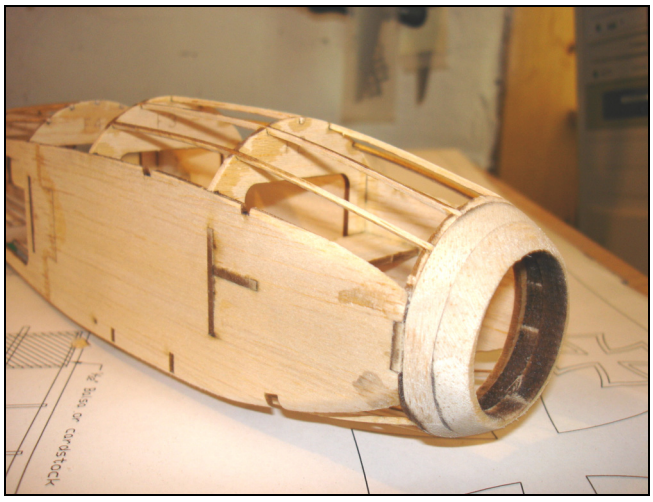
FUSELAGE CONSTRUCTION

The fuselage is built as from 1/16″ balsa side structures, which are then joined over the plan. Use the notches in the side slabs t mate with the tabs placed on the formers. This system not only keeps each stage simple, but it also helps to ensure a straight fuselage.



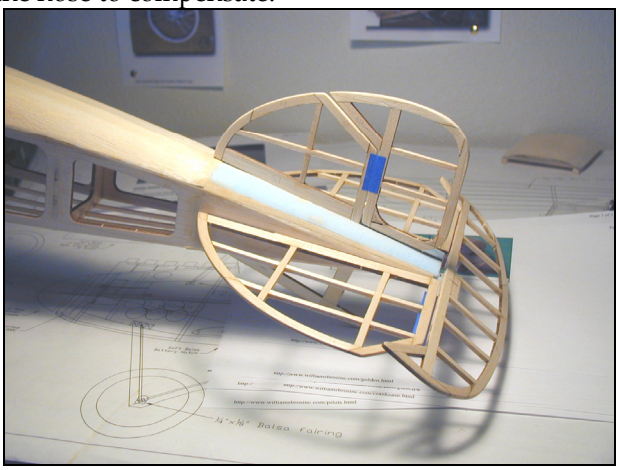
Fuselage Detail

Join the two frames over the plan with formers and the tail skid mount F7. Check, check and check again that this and ALL other structures remain perfectly aligned. The right side of the fuselage is a bit shorter than the left side. This is to build in right thrust and allow the spinner to rotate properly on the model. Former F1 is also angled a bit for down thrust. Using wooden blocks can help in aligning the sides while glue sets.
Place F7 carefully. It is designed to run down the centerline of the fuselage. It serves to position the vertical stabilizer and tail skid. Use a length of 3/16″ diameter birch or hard balsa dowel at the end of the fuselage. This gives the fuselage a nice rounded termination.
The cowling is of built up construction using C1 and C2. Sand to shape. Make it removable using Neo magnets to allow easy access to the GWS IPS motor.



Cowl Detail

Stringer the top and bottom of the fuselage with the 1/16″ balsa square stock included in the kit. Add bottom stringers from F1 to F6 in one piece, glue then cut away the stingers for the battery hatch. This process will insure that the front section stringers bend properly to the required shape of the nose.
Use light blue/pink insulating foam to fill in the area aft of F7 to the tail. Sand to shape. Do not use heavy balsa, as the added weight will require much more ballast weight in the nose to compensate.



Sand Blue Foam to Shape Fuselage

Adding the Undercarriage mounts

The undercarriage is mounted into wood mounts in cutouts in the fuselage sides.

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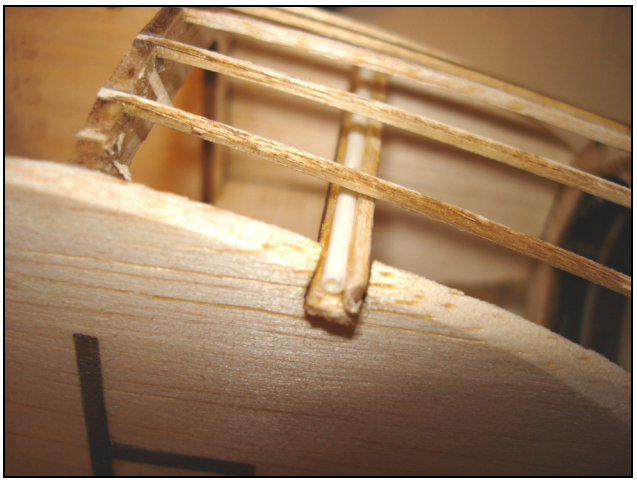


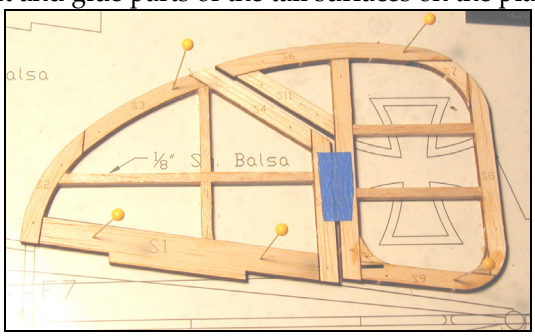
Undercarriage Mount Detail

Adding the Decking

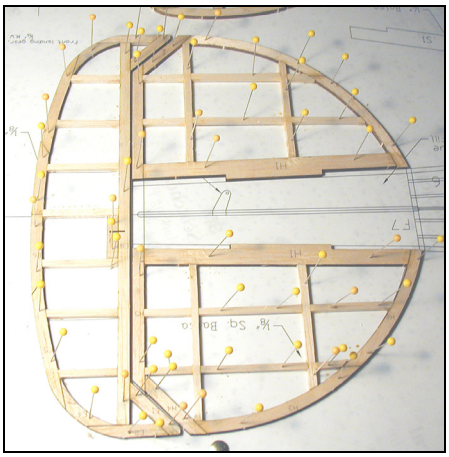
Carefully trim to size and fit 1/32″ balsa /cardstock cockpit sheeting. Scrap pieces of 1/16″ balsa are added next to the cabane struts before covering.

TAIL SURFACES

Lay out and glue parts of the tail surfaces on the plans.



Tail Surface Detail

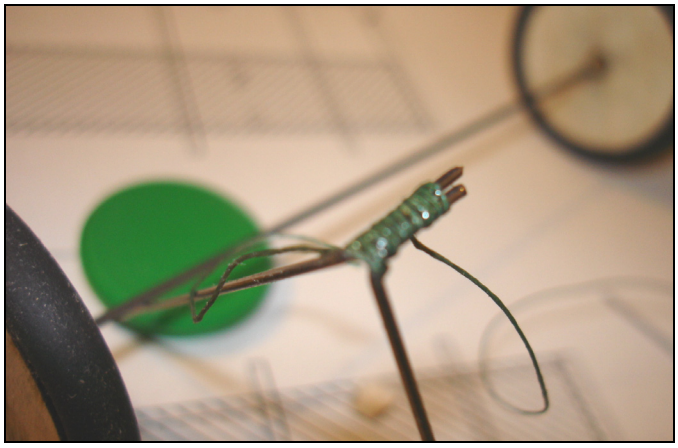


Tail Surfaces Pinned on Plans

Sand the tail parts, rounding off all edges. Don't add the horns or hinge the surfaces until after covering is complete.

LANDING GEAR

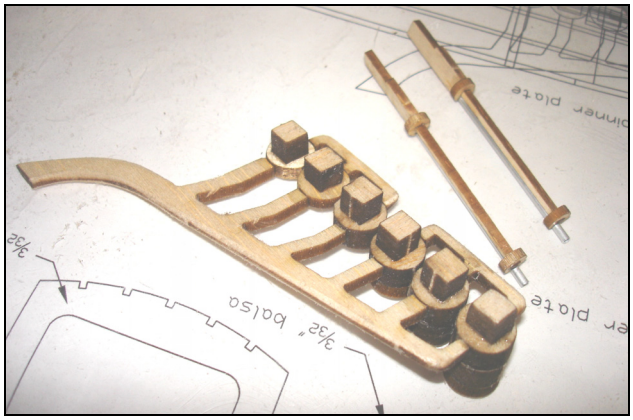
The landing gear is made from 1/16″ music wire



Landing Gear Detail

DUMMY MOTOR

Assemble the dummy motor from the balsa parts supplied and sand to shape. Not all the parts of the engine are supplied as some are best fabricated from other materials. Solid 16-gauge copper electrical wire insulation makes an excellent "radiator hose".



Motor Detail

DUMMY MACHINE GUN

Assemble the dummy machine gun from the balsa parts supplied and sand to shape. Use a balsa dowel or aluminium tubing to form the gun barrel. Wrap the printed cooling jacket pattern around the end spacers. For

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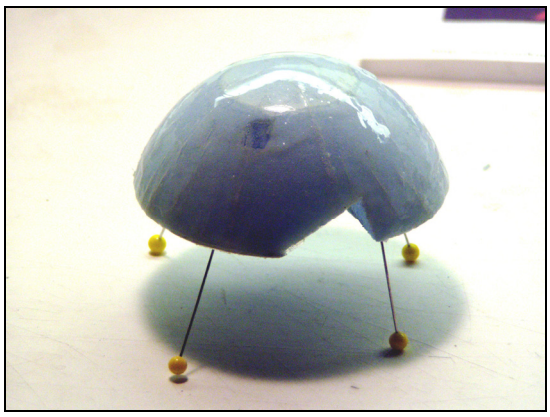
extreme detailing, use a fine point soldering iron to burn away the cooling holes. Hardening the paper with thin CA prior to painting may be required, if this step is taken.

SPINNER

The spinner is composed of fiberglassed blue foam. The spinner is made from blue foam which is tack glued to a piece of 1/32″ ply. Epoxy a short 1/4″ diameter dowel to the back in the center of the disk. Place the assembly in a drill chuck and sand the foam to shape while it spins. Glass the foam using standard glassing techniques. (Note: Minwax Polycrylic is an excellent substitute for epoxy). When the epoxy is ready, cut the excess fiberglass away. Then remove the plywood and carve out the necessary recess for the propeller. Drill out the dowel on the plywood disk. Glue the spinner to the plywood disk after the prop is mounted to the model. It should be perfectly aligned with the fuselage. It looks complicated but in practice the process goes easily and works very well.



Spinner Detail

COVERING

Any lightweight covering material can be used. Polyspan with dope or Minwax Polycrylic makes a good choice Litespan is also popular. Edi Werner used Litespan. When covering the wings, be mindful that the trailing edge stock is light balsa and not over shrink the covering material. The structures are designed to be as light as possible and care must be taken not to distort the frame. The fuselage sides are made from sheet balsa so that the fuselage may be stained and finished in a more scale like wood showing fashion. Use simulated wood graining painting techniques for the top and bottom of the fuselage.

Decal outlines for this model are available on www.aerodromerc.com/decals in Adobe Acrobat pdf format for printing on decal paper.

WHEELS

Gluing the ply sides on the 1/8″ balsa core makes the basis for the wheels. Use the brass tube hub for alignment. Epoxy the hubs in place and add a sufficient amount of epoxy around the base of the hub to reinforce the connection of the hub to the ply. Plywood reinforcing hubs are provided that are to slip over the brass tubing as shown. Next, CA glue the neoprene cording together to from a “tire”. Use thin CA sparingly as the CA bonds very aggressively to the rubber. Press the CA wetted ends together for an instant bond. The best way to align the ends is to glue them while they are in place on the wheel. Then attach the tires to the wheels and CA in place. A thin bead of CA around the rim makes for a secure tire.

Paper cones are cut out. Use a ball point pen to score each line on the back to make an impression of “spokes” It is helpful to do this operation on a paper tablet so that the pen makes a good crease. Fold the paper along the crease lines to exaggerate the raised lines. One of the sections forming a wedge is cut out. Make cuts to the center of the circle along a pair of the spokes. Close the paper cutout to form a cone and tape the joint inside the cone.

The inside cones may now be attached to the wheels. The outside cones may be attached at this point if wheel collars are to be used. Alternatively, after installing the wheels on the landing gear, a washer may be soldered to hold the wheel in place and then the cone is attached. This method makes a very nice scale appearance.

INSTALLING THE RADIO CONTROL GEAR

Servo Mounting

Actuation of the two controls is coupled together. Differential aileron throws are used; the connections of the pull lines from the up side of the ailerons are about 20 degrees from the perpendicular relative to the rudder connection. Down pulls are actuated by a small spring or elastic cord attached near the lower rear IP strut mount. Pull-pull controls are recommended for rudder and elevator to help with C/G.

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The elevator servo is mounted in the fuselage as far forward as possible.
The upward pull line of the aileron servo line is routed from the front arm of the aileron control horn down to an eyelet mounted in the rib near the return spring. It then turns and follows along the op of the lower wing and enters the fuselage through a hole in the wooded sides. The aileron servo should be mounted there.
At low speeds, the ailerons are not very effective but the rudder provides the necessary yawing action. This feature allows for taxing control.

Battery Tray

After all the above has been placed, mount the battery tray made from 1/8″ balsa and use the battery position to balance the model as shown on the plan.

ASSEMBLY

Wing

Preformed laser cut plywood cabane struts are included in the kit. These are dry fit and sanded to fit into notches in the fuselage sides, which have small 1/32″ plywood and balsa crosspiece reinforcements. Epoxy them in place. Pre cut balsa inter plane struts are also included in the kit. They are glued into slots in the ribs of wings.

Fitting Tail Surfaces

Lay out and glue parts of the tail surfaces on the plans. Sand the tail parts, rounding off all edges. Don't add the horns or hinge the surfaces until after covering is complete.

Fitting the rigging wire.

Use strong thread or Kevlar fishing line or elastic beading cording to simulate rigging wires. Use small screws, fishing hook eyes, straight pinheads or small eyelets to attach the lines. These "wires" can add a degree of strength to your model.
Windsock Datafile "Albatros DII "publication has details on placement and markings. Available at
http://www.byrdaviationbooks.com/

Battery hatch

Fashion a battery hatch from blue/pink insulating foam.

Balancing the Model

Balance the model at the point shown. It is best to position the battery to do this operation.
NOTE: The GWS motor is very light. Use a heat sink. Avoid adding lead to balance, keep the tail weight as light as possible.

FLYING

The model should ROG on pavement or hard surfaces.

In Flight

In Flight

Let the model gain altitude slowly off the runway. Applying too much up elevator at slow speeds risks a stall. Make your turns gently as tight turns risk tip stalling in any model. Don't expect the elevator to make the model climb. Think of the elevator as a device to change the attitude of the model. The wing and airspeed ultimately make the model climb. Often down elevator applied at stalling can avoid a major crash. The most important details for proper flight operations are:

1) CG location. Tail-heavy models never fly well or at all.
2) Down and right thrust
3) Straight and non-warped wings.

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Here are some excerpts of Edi's maiden flights.

"The maiden flight was rather shortish. She came off the ground after about 30 ft on 2/3 throttle although I had to use a much higher geared power plant than the one recommended - a leftover from a LiteStick. She climbed nicely and just pulled a bit to the right, probably due to the light wind. I got her around in a smooth left turn when she started to spin - the motor had come loose. From the nose-in from aprox. 15 ft. height she took surprisingly little damage; only the cabane struts had come loose at the fuselage. The second fly ended head-on in a bush at full speed after only 30 secs; for some reason I had been unable to gain height and I didn't feel like trying sharp turns, hoping in vain to just miss that bush. But again, I only had to reglue the cabane struts and could go on trying. After a few more tries resulting in taxiing off the runway and toppling over in the freshly mown grass, she took off again and climbed slowly into the evening. Responsiveness and handling is very good and she is a rather docile, calm flyer, looking surprisingly scale for such a small model. I was especially surprised that she didn't react more to the wind."

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