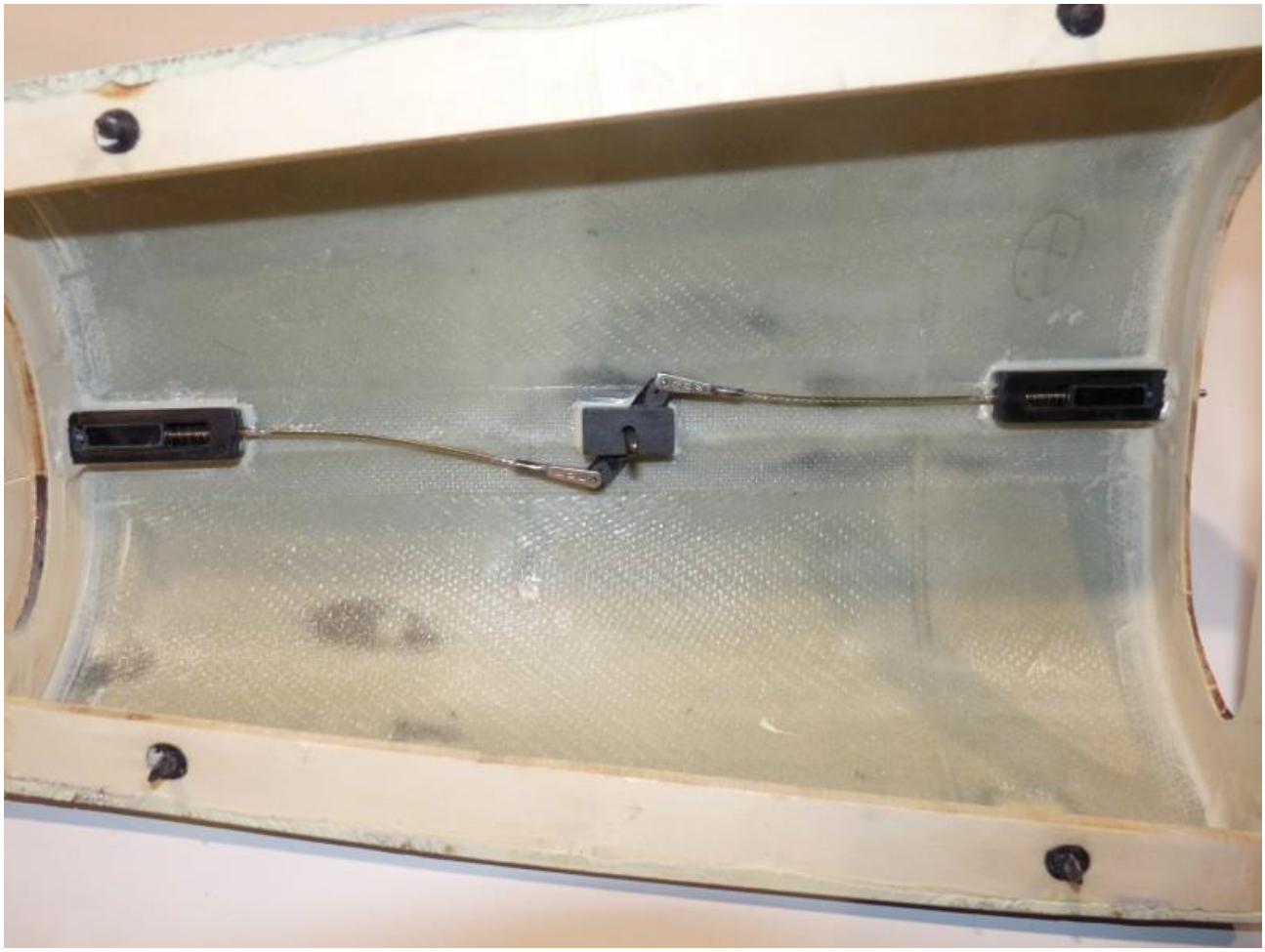
Building Instructions ME 163 B 1a M 1:5 Turbine

Thank you for choosing our kit of the Me-163B. We ask you to read the instruction once in advance before building this kit in order to avoid mistakes. Make sure that you identify which photos accompany which step of the build before you start. Please keep in mind that this is a model airplane suited for turbines of up to 8 Kg of thrust. Please beware that all parts used in the construction of this kit have to be strong and large enough. Sunshine Modell is making an effort to keep the kit as light as possible while not making any compromises regarding the stability of the airplane. In order to keep the assembly of the components as straightforward as possible we deliver all GRP parts with a clear coat instead of a colored gel coat. This way you have the opportunity to check all fits and glue-joints.

Our Me-163 comes with the original s-shaped airfoil design used by Mr. Alexander Lippisch. The model aircraft possesses excellent slow-flight characteristics and does not tend to stall. The function of the different control surfaces has to be maintained as described in this manual as the airfoil design differs from other airplanes and kits. The ailerons serve as ailerons and elevators in typical delta style. The inner control surfaces, called Flettner Flaps, are to be set slightly up for takeoff and possibly landing. The deflection should be at around 5 to 6mm up. It is necessary to test the function of the Flettner Flaps in mid air in order to get a good feeling for how they work and what they do and to learn at what speed to deploy the flaps before your first landing approach with deployed Flettners. The airplane will climb in case it is still too fast for Flettners but at the correct speed it will simply continue to fly straight and you can initiate your approach. The rate of glide is excellent and the airplane will fly stable and true with deployed Flettner flaps, even at slower speeds. Without deployed Flettner flaps and in zero or low wind conditions it will be difficult to maintain a controlled approach. Since the Me-163 has a wide speed range it is up to the pilot to get familiar with the flaps and what they do at what speed. Again, do so before you come in for your first landing. You should mix the flettners in at around 33% to 50% with the elevator function of the elevon/delta mix, and ONLY the elevator function. This will greatly assist you during landings and at lower speeds.

Fuselage

Please rinse the fuselage and all composite parts thoroughly, possibly even wetsand them using 800plus grit in order to eliminate any mold-release leftovers. Cut out the hatch using a very fine blade along the visible line. Frame up the opening of the hatch using balsa and fabricate a frame for the hatch itself made from plywood. You can either hinge the hatch or insert it "concealed" using a quick-release. The quick-release pictured is operated by an Allen wrench, for example, which you can see sticking through in the middle of the mechanism/servo horn. All that is visible on the top will be a small hole big enough to accept the wrench.



If possible do not cut out the triangular windows behind the cockpit. You would think that they will add to airflow to the turbine but what indeed happens is that they create a "suction" effect. The air traveling around the fuselage is being forced around this solid airframe, hence accelerating and producing a low pressure scenario. Just like it does traveling around an airfoil, which actually results in lift. In our case the "lift", or rather low pressure will suck air out of the fuselage, the turbine will have to fight for its intake air. POSSIBLY even resulting in flames traveling forward when you get off the throttle, either through the exhaust pipe or even the compressor wheel. Both scenarios can lead to an onboard fire. So, in spite of common sense, refrain from opening up the side windows if possible and rather get your airflow from the front. For that you want to install two screened openings as far forward as possible. The further you are to the nose, the more of a ram-air effect you achieve opposed to a vacuum effect. The above mentioned accidents have only happened very seldom, but still we believe that we need to inform you about the specific aerodynamic scenario and the

dangers of getting your air from a low-pressure environment. Another solution that comes to mind would be perfectly executed Naca scoops, featuring straight edges and a soft lip. Much harder to build than two screened cutouts in the front, but maybe a valid alternative.

On the photo above you see one of the two screened inlets to the left of the red circle. In our opinion the location is to far aft and should be more in front in order to increase the ram-air effect. This would, on the other hand, be a valid location for a Naca scoop. Try NOT to open the side windows even if the plans say so. Should you have any questions please call us at 919-533-6275 in order to discuss this subject and in order to get the latest information.

The Turbine

Use a 50N to 90N size turbine. Install the turbine in the turbine brackets using the hardware the turbine manufacturer supplied you with.

Should you install a tailwheel make sure to enclose it in order to keep dirt and contamination out of the fuselage. Place all components as far forward as possible. The custom fuel tanks will be placed in the wing pockets making for 2,2 Liters of total capacity.

Skid

Install the brackets and guidetubes in the skid. I would recommend to install the dolley a bit in front of where the plans recommend in order to keep the tail from bouncing during takeoff and taxiing. Make sure to accomplish 6 to 7 degrees of incidence once the Me163 is on its dolly. Should you have less you will possibly run into delayed take-offs, possible damaging your airplane.

The wings

Basic functions:

The outer rudders serve as elevons/delta. The inner rudders, called Flettner flaps, are only to be used in combination with the elevator function and as trim flaps, NOT traditional landing flaps.

The ailerons are hinged by a carbon rod. There is a wooden bracket which serves as a bracket which needs to be installed in the mid-section between the ailerons and flettner flaps. You need to cut an opening underneath the wing in order to be able to position and install said wooden bracket and glue it in place using epoxy once everything is aligned correctly.

The gap left and right of the aileron will be filled up with balsa in order to keep the aileron from sliding sideways.

Cut out the flettner flaps along the visible lines and install the guide-tubing for the rod on the root-rib side of the flettner flap using epoxy. Test fit before applying glue. Once this assembly has cured you can install the wooden bracket that holds the other end of the flettner rod. You can at this point still pull out the rod at the root rib end of the wing, the flettner is still detachable. You want to secure this rod later on, of course, once everything is painted and installed.

You can, of course, use standard pin-hinges. In that case you will need to fill up the leading edge of the flaps and trailing edge of the wing using balsa.

Fabricate servo brackets according to your preferences. The position is predetermined by the rudder horn brackets inside the ailerons.

Important

Use utmost caution when installing the rudder hinges and brackets. Do use the included wooden brackets and the according axle rods.

Wing Joint

Start by gluing the wooden “root” ribs into the fuselage’s wing pockets. Transfer the location of the holes of the wings to the fuselage and fit everything to size. Once the wings are finished slide the wing tube in place, using the former that holds the wing assembly (make sure to sand the inside of the fuselage where surfaces meet beforehand). Now use an exact incidence meter and make sure that everything is aligned (making sure that both wings have the same incidence). Tack the former in place using CA. Now take off the wings and glue the former in place using epoxy.

Now install the wing bolts that hold the wings down. Install the bolts into the wings and mark where they meet the fuselage. You can now install the counterpart to the bolt.

The slats

Fit the slats to the wings and install according to the plans. In order to achieve a larger bonding surface you have to close both ends of the slats using balsa. It is important to support the slats using feet in the 3 places according to the plans.

The rudder

Just like the ailerons the rudder is hinged using a carbon rod
Please make sure that you are satisfied with the strength of the vertical stab. That is the one "flutter" area of the Komet. You might even want to consider installing counter balance weights should you want to go extremely fast. The original Komet used counterweights and so should we do we decide to overpower our model.

The canopy

Cut the composite canopy frame out of the composite canopy and install the vacuum formed clear canopy. There is a template that will show you the correct angle of the canopy.
Make sure to sand all bonding surfaces before applying glue.
The original canopy opened to the right.

Maiden flight

Being a flying wing the CG HAS to be correct!!!!!!!!!!!!!!!!!!!!!!!!!!!!

Balance the airplane with fuel tanks being half full. Drill holes into the top of the fuselage at 185mm. You will find the exact location on the plans. Now you can suspend the plane at these holes using steel rods in order to balance the plane. The nose has to point down by around 10 to 15 degrees.

Take-off

Accelerate controlled and keep the elevator pulled until the airplane takes off by itself. You can trim the flettners 5-7mm up for takeoff. Due to the low drag of this airplane and due to it landing on the skid landings can only be done with the turbine being shut off.

Be aware that this plane has very low drag and will travel.