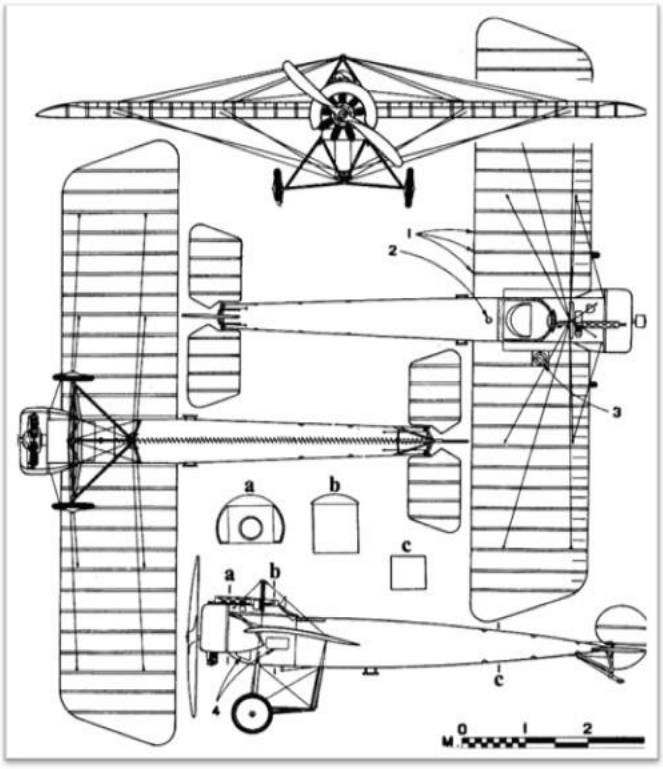
Balsa USA Eindecker 90

The manufacturer lists the weight of the plane at 7.5 to 8 pounds, and has an 80-inch wingspan with 1155 square inches of wing area, or 8 square feet, so even at the top end of the weight scale at 8 pounds, the plane only has a wing loading of 16 ounces per square foot.

Looking at the full size Eindecker, it had a wingspan of 31 feet 3 inches or 375 inches, so this model, with a wingspan of 80 inches has a scale factor of 1/4.6875. The full-size plane had a max weight of 1345 pounds and had a 9-cylinder rotary engine that produces 100 HP or 75,000 watts of power. This gave the Eindecker a power loading of 56 watts per pound, which was typical for that era. Normally, our RC models have about double the power of their full scale counterparts, so 100 watts per pound or a bit more would fly the plane very well.

Looking to prop size, the full-size Eindecker had a prop that was 8 feet in diameter, because the older rotary engines only spun at around 1400-1500 RPM at full throttle. A scale size prop for this model would have a diameter of 96/4.6875 or 20 inches. If you look at a scale 3-view of an Eindecker, as shown below, they had very little ground clearance for the prop, so on a model, to maintain decent ground clearance, you would want to limit your prop size to something in the 16-17 inch range.



When calculating scale speed, the recognized rule of thumb is to take the speed of the full size aircraft and multiply it by the square root of the scale factor. The Eindecker had a top speed of 140 Km/Hour or 87 MPH. The square root of 4.6875 is 2.165, and if we divide 87 by that number we get a scale speed for the model of just 40 MPH. Obviously, you can fly faster than that, but at 40 MPH, the plane will look like it is flying at the same speed the full size aircraft did.

With all of that taken care of, we can look for a motor that will turn a 16-17 inch prop and make 800 watts of power or more, with a pitch speed of a little over 50 MPH. Since this aircraft had a very short nose, due to the weight of the rotary engine, a larger motor would be OK to use to help keep the model in balance.

Looking at our motors, the one that provides the best combination of weight, Kv and performance would be the Cobra 4130/16, 390Kv motor. This motors does very well with props such as a 16x8, 16x10 or 17x8. Running on 6 cells with a 16x8 prop you get the following full throttle performance numbers.

Volts – 22.2
Amps – 44.2
Watts – 981
RPM – 6807
Thrust – 152 ounces (9 pounds 8 ounces)
Pitch Speed – 52 MPH

If you wanted the ability to fly a bit faster, then you could use a 16x10 prop and get 11 MPH higher speed with only a 4-amp increase in current draw. Here are the numbers for that combination.

Volts – 22.2
Amps – 48.5
Watts – 1077
RPM – 6668
Thrust – 153 ounces (9 pounds 9 ounces)
Pitch Speed – 63 MPH

This motor is rated for up to 55 amps of current, so you would want to team it up with a 60-amp ESC. Below are links to these items on our website.

Cobra C-4130/16 Motor: https://innov8tivedesigns.com/cobra-c-4130-16-brushless-motor-kv-390.html

Cobra 60-amp ESC: https://innov8tivedesigns.com/cobra-60a-esc-with-6a-switching-bec.html

APC 16x8-E Prop: https://innov8tivedesigns.com/apc-16x8e-propeller.html

APC 16x10-E Prop: https://innov8tivedesigns.com/apc-16x10e-propeller.html

The XOAR Company also makes a series of WW1 Simitar style props, like the one shown in the photo below, that give a very nice scale look for the model if you wanted to go that route.

The Balsa USA company carries these props, and they have them available on their website at the following link.

https://balsausa.com/products/16-x-10-xoar-scimitar-prop