

DORNIER Cs2

By WALT MOONEY . . . Another obscure design from the Ol' Professor, this one for CO₂. As is typical with his models, it's a fine flier.

• Here is a CO₂-powered flying boat model that will consistently take off from the water unassisted and put in smooth, stable flights. The model as shown weighed two and a quarter ounces, and has been modified from exact scale in two ways to enhance its flying stability and hence its flight capability. It took first place in the CO₂ event at the Flightmasters Seaplane contest on two different occasions. Takeoffs are smooth and beautiful, and landings are a joy to behold.

The two deviations from scale are an increase in dihedral tail size and the addition of dihedral to a wing that was originally perfectly straight. These changes were made because it was felt that taking off the water with a nice-flying model was enough of a challenge without the added problem of having a design that was hard to trim.

The original model had a Brown Junior single-cylinder engine installed as shown on the plan. It works very well in warm weather, but because the tank is completely enclosed in the body in the interest of watertightness, it also has very little air to provide the heat needed to vaporize the carbon dioxide in the tank. As a consequence, in cool weather the model is not likely to give you one flight right after the other. It takes a little time to heat up the air inside the body between flights. A provision for ventilating the hull could reduce the necessary wait between flights, but if the model gets dunked by a big wave or by blowing over, the resulting wet inner fuselage will require a still longer time to dry out.

Two versions of the Dornier were built. The first was modified by Dornier

with a longer nose and higher rudder, and both versions were modeled. Both take off well, but the longer nose and increased rudder area is a distinct improvement.

The pilot of the Dornier sat right behind the engine (how he saw anything forward from this position is beyond me, but in those days there was almost nothing else in the air, especially over the oceans, so maybe it didn't make any difference anyway). It does make an ideal place to position the filler fitting for the engine installation. It is strong, not too conspicuous, and is easy to hold onto while the fuel is being replenished.

The propeller that was used for all the flights was the silver plastic Cox gas engine .020 propeller. This worked well, but I suspect a higher-pitch, broader-bladed propeller would work even better. Experiment and see what works best for you.

Constructing the structure of the model is very simple. Only a few details need special consideration. All edges of the bottom surfaces of the hull and other parts of the airplane that come in contact with the water should be sharp. DO NOT, I repeat DO NOT sand any of the bottom longerons, steps, or sponson trailing edges even a little rounded. Doing so will prevent the model from taking off. The above statement goes for any seaplane, not just this one.

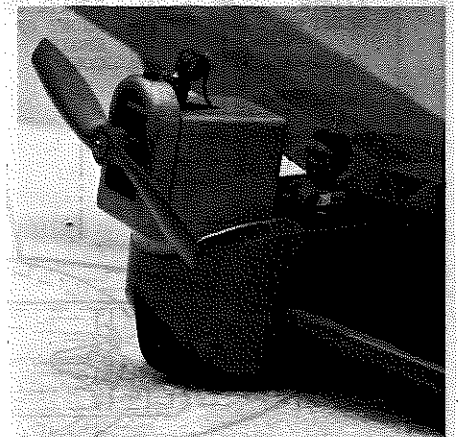
The location and angle of the sponsons is important. The plastic water rudder is important also. A free flight seaplane that swerves during the takeoff run is just asking to get blown over and swamped. The model should balance a little less than an inch forward of the

step.

The model must be waterproof if it is to survive very long as a seaplane. This means it must be doped. To keep the model from being warped by the shrinking dope, the dope should be plasticized. There are several plasticizers that can be used, but camphor used as a material for reducing the shrinkage of dope also seems to make it more waterproof with fewer coats. Dissolve the camphor in dope thinner and then thin the dope.

Finally, keep the model light in weight. This is important for any flying machine, but is especially so for seaplanes. Water has 800 times the density of air, so a small increase in water wetted area can result in a large increase in water drag. Also, the spray pattern gets bigger with higher weights and can impinge on more and more of the model. Water droplets clinging to a full-size seaplane may not add a significant amount of weight, but on a model, oh my!

Have fun flying your Dornier. Where else can a grown man find an excuse to go wading? •



Closeup of the nose on the Dornier. Note how the tank filler is hidden in the pilot's head.

**MODEL
BUILDER**

#5792