Designing Model Aeroplanes

UNLESS you have had experience in model plane making, it is always best to choose a "flying stick" type for your first self-designed machine. Later, you will find it easy to design models with built-up fuselages.

No model plane will fly unless it has the right amount of wing-span, so the first thing to do is to decide what size wing your machine is to have. From the wing-span, whether for biplane or monoplane, you can work out all other measurements required.

The width of the wing will depend partly on what weight and what speed your model will have, but it is sufficient to assume that the chord (width) should be in the ratio 1 to 8 compared with the wing-span. You can experiment with this figure later if necessary.

Fuselage length is easily settled—it should be two-thirds the wing-span. Thus, a three-foot wing needs a two-foot fuselage. This rule applies for both stick and built-up fuselages.

The tail-unit should be considered in two parts. Firstly, the elevators and tailplanes should be one quarter the area of the main-plane or wing. Their shape is not particularly important, but you should follow the design of real aircraft as this looks neatest. For the combined fin and rudder you should have an area of one-half the tail surface.

You need consider only one other dimension for a simple model plane—the camber, or depth of wing at the point where it is most curved. This should measure approximately one-sixth of the chord.

In all models it is wise to keep the weight as low as possible. You can easily add more if your machine is too light, but it isn't always so easy to cut down the loading when the plane is finished. Unless a model has unusual speed, it should not weigh more than 5 to 7 ounces per square foot of main-plane area. Long-distance fliers should be considerably lighter.

Many fellows are puzzled to know whereabouts on the fuselage to set the wing. This is a matter for experiment, and you should therefore fix the wing only temporarily at first and test it in flight in various positions.

The amount of elastic required to drive a model plane depends on the weight of the machine. Roughly one-sixth the weight of the plane is a good figure for the amount of elastic needed. Thus a model weighing 6 ounces needs 1 ounce of rubber to drive it. If this makes up into more than four strands, it should be fitted to a gearing device.

Models designed for special types of flying should be given extra attention. For long-distance fliers, lightness is the thing to aim at; for speedy machines cut down head-resistance as much as you can, and give the model all the power it will take. Really fast ones carry heavier loads than other types.