The art of KNIFE EDGE FLIGHT

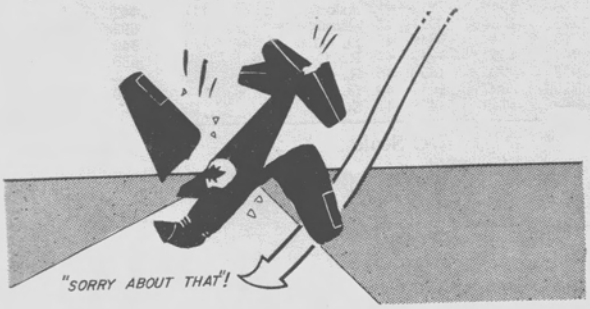
A fascinating manoeuvre for R/C fun flying and a test on nerves

by—*Maurice Franklin*

THE first requisite for knife edge flying seems to be an aeroplane capable of performing this fascinating manoeuvre. Designwise therefore, the most important attribute seems to be generous fuselage side area. In other words when the aircraft is turned on its side to perform the knife edge manoeuvre, it tends to fly on the lift generated by the fuselage. If the fuselage lacks side area, it doesn't have sufficient lifting surface to hold its own as it were in this attitude. My own first attempts at the knife edge manoeuvres were with a very slender fuselage aeroplane. The aeroplane was not capable of performing a really true knife edge, and would eventually fall out of the sky in a large arc.

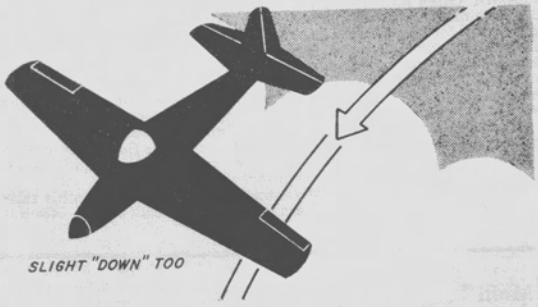
The secret discovered was to position the model well upwind, and then "split Ess" to pick up speed. Then, lift the nose, and roll the aeroplane to the vertical as we do for the four point roll (first leg of the four point). At this point we throw in opposite rudder and with the nose in a high attitude the model should, theoretically, hold the knife edge for quite a considerable distance before gradually dropping off. In other words you have to watch out, otherwise the model will drop into the ground.

I have seen this happen to some people who have tried the manoeuvre to the bitter end, but with generous fuselage side area as per my *Henchman*, the attitude can be held with no problem at all. The Henchman will, in fact, fly knife edge upwind or downwind and if too much rudder is fed in, the machine will actually climb on its side. Consequently you have to find the happy medium.



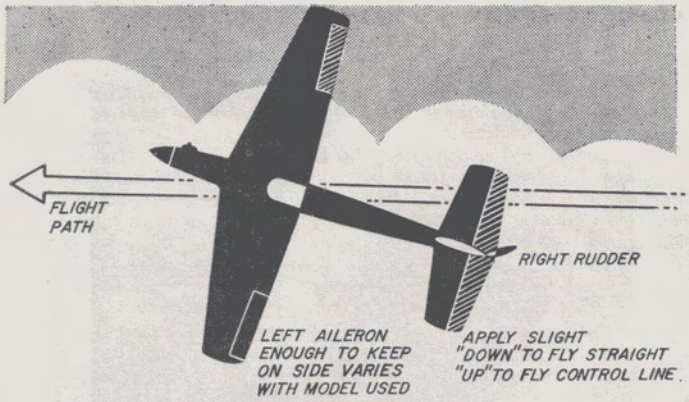
Turning in a knife edge attitude is quite fun. I have even had the Henchman performing circles around my head with the thing on its side. But this gets you very, very dizzy if you have been away from the control line circle for too long!

Naturally in this case, it is possible to feed in the elevator and too much rudder. I have fallen into this trap which causes the aeroplane to suddenly stop flying entirely and it just falls like a rock. This is due to the high drag created with all the control surfaces deflected, reducing air speed to the point where it becomes insufficient and the model just drops. I have had this happen to me on several occasions, but luckily have always been prepared for it. The knife edge circle is performed by feeding in slight



aileron and opposite rudder. Up elevator then tightens the circle and you will probably find that you need more rudder as the circle tightens. As I say, it is necessary to be on your guard because at some point in this exciting antic the aeroplane will just stop flying entirely and drop fast without warning.

First attempts at knife edge flight should be made by positioning the model upwind. Then really speed downwind and throw the aeroplane on its side by the use of ailerons, bearing in mind that once the wings reach the vertical position, a little aileron is held in to counteract the rudder. It is best to throw in full rudder and see what happens to the aircraft. If the machine climbs, there is too much rudder throw, but excessive rudder movement can also cause the model

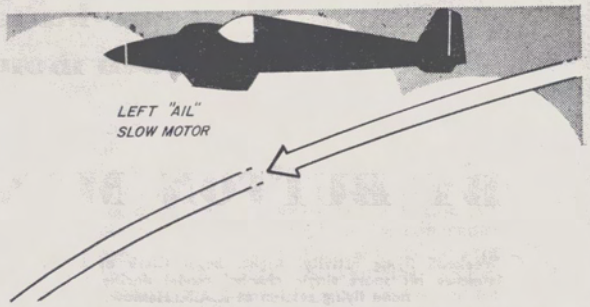


Above: Knife edge technique

to drop, if the drag created reduces the air speed.

Another exciting play on the opposite rudder and aileron command technique used for knife edge flight is the crab landing which is very good fun to watch. Here the model is flown high along the downwind leg of the landing approach. Then the throttle is retarded and slight aileron applied together with opposite rudder. Once the technique of aiming the model is acquired the aeroplane will actually side

Below: the slide-slip landing



slip completely and utterly to the ground in front of you. The model lands on the runway cross-legged which is heavy on tyres, but it is a thrilling thing to do and makes the most of proportional control which is essential for this type of flying.

Naturally, the more aileron you throw in, the steeper the angle of drop will be, combined with opposite rudder, and once you've committed yourself, do not let off. If you do, the model will just drop, and the ground is very hard! The model must be held in the crabbing attitude throughout the landing, feeding in up elevator to flair out.

THE HENCHMAN

DESIGNED FOR KNIFE EDGED FLIGHT

The "Henchman" is a multi aerobatic model specifically designed for Knife Edge flying, which explains the rather hump backed appearance of the fuselage, which has enough side area to support the model in the air during the knife edge manoeuvre.

The machine spans 63 in., but has only 530 sq. in. wing area. Maurice's original weighed 5¼ lb. and was powered by an Enya 60 II, Kraft KP-6B proportional equipped. We built one to find out what the knife edge bit was all about. Ours turned out at 6 lb., but is extremely forgiving on landing approaches despite lack of wing area and sharply tapered wing. Knife edging is fun, even though we have not yet fully mastered the technique.

Incidentally, although not marked on the plan, wing and tailplane use Zero-zero incidence settings. Maurice Franklin now kits the "Henchman", which sells in U.S.A. for $29.95.