
SLICK-FLI
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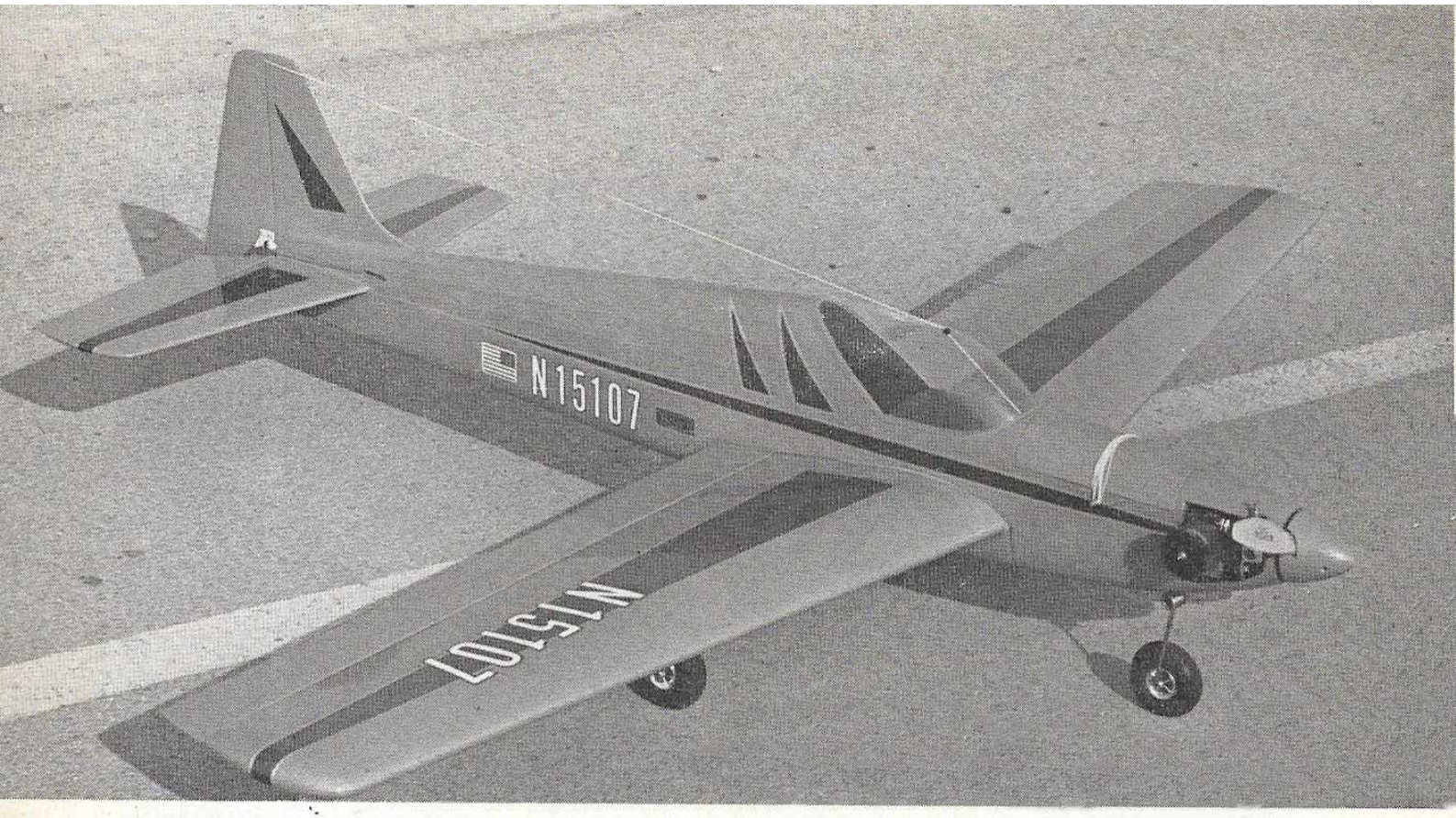
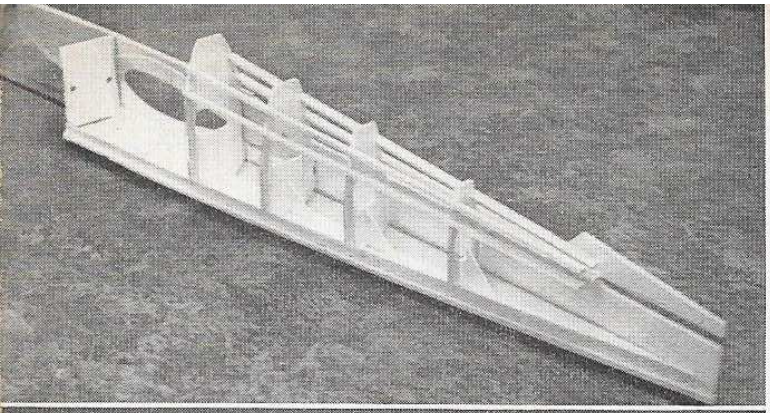
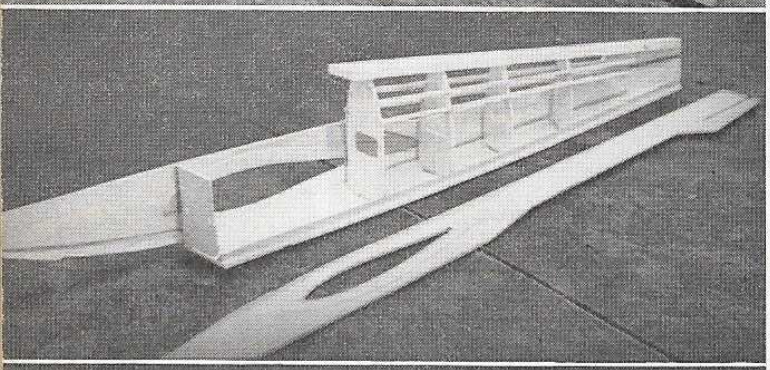


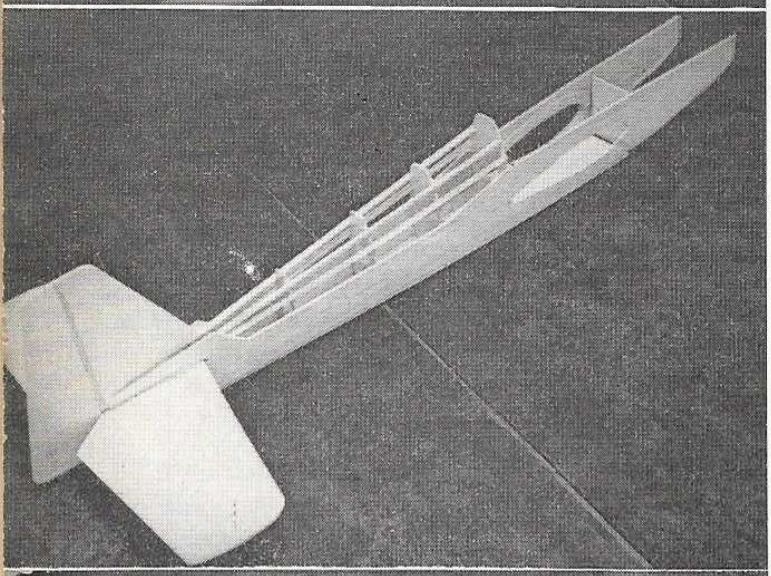

IN the past, my design efforts have been towards radio control contest designs with the emphasis on fast construction, servicability, and general simplicity. Aerodynamic efficiency was compromised to achieve this objective. The 'Slik-Fli' was an experiment to determine desirability of several aerodynamic features. These features were: (1) the swept leading edge tapered wing which, because of the sweep back, would contribute to stability; (2) the midwing configuration which supposedly would make the aircraft more manoeuvrable by concentrating the centre of lift closer to the centre of gravity; and (3) the flap coupled with the elevator which had proven so successful on control line models.

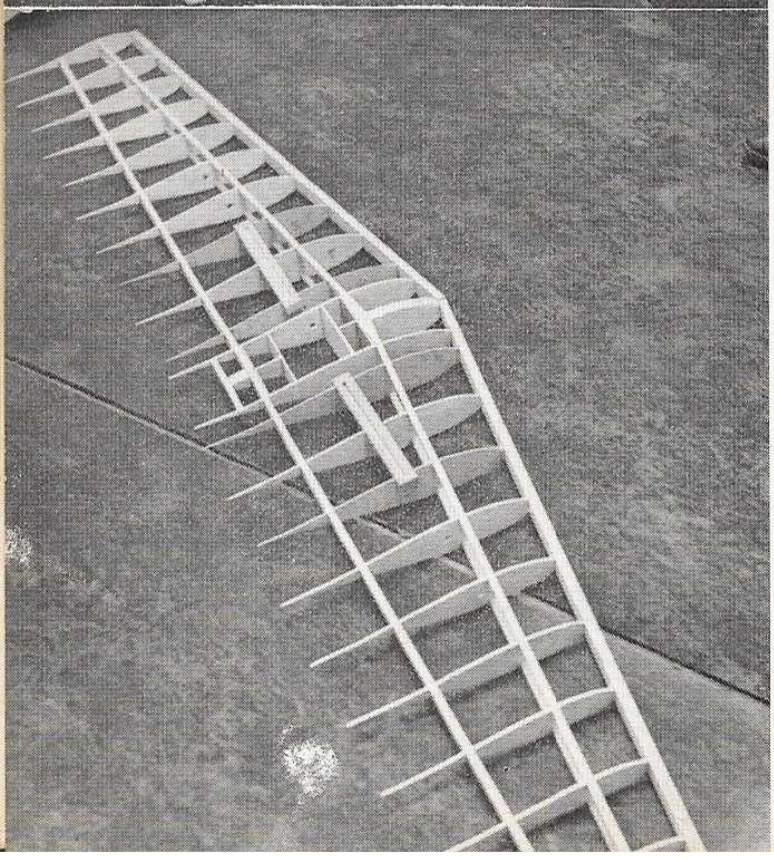
Certainly, the results of tests on one design are not conclusive, but after a great deal of testing, it appeared to me that none of these so called features offered any advantage over the standard approach. In fact, they seemed to have many disadvantages.

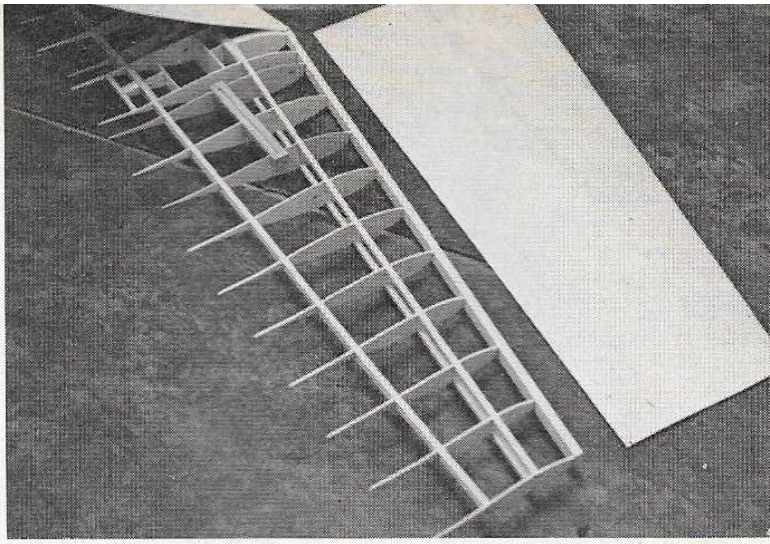
The first disadvantage to the 'Slik-Fli's' configuration was in the swept tapered leading edge wing. We had to stow the battery back behind the wing as the model came out quite nose heavy. First test flights, however, were quite impressive. Usually, one tends to become overly enthusiastic when flying a new design for the first time, and I certainly thought





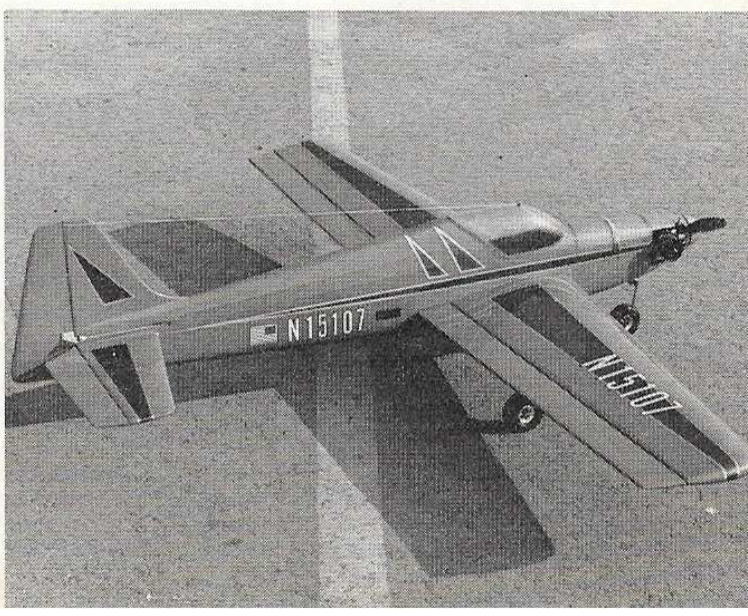


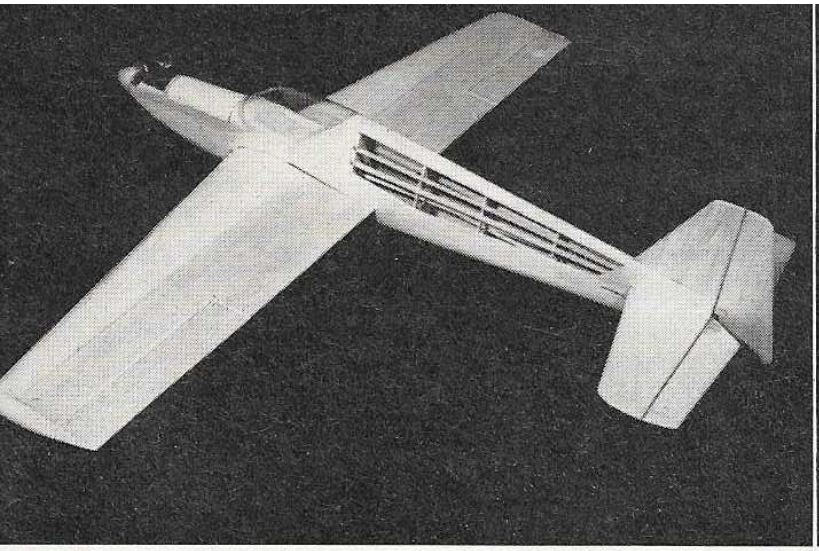


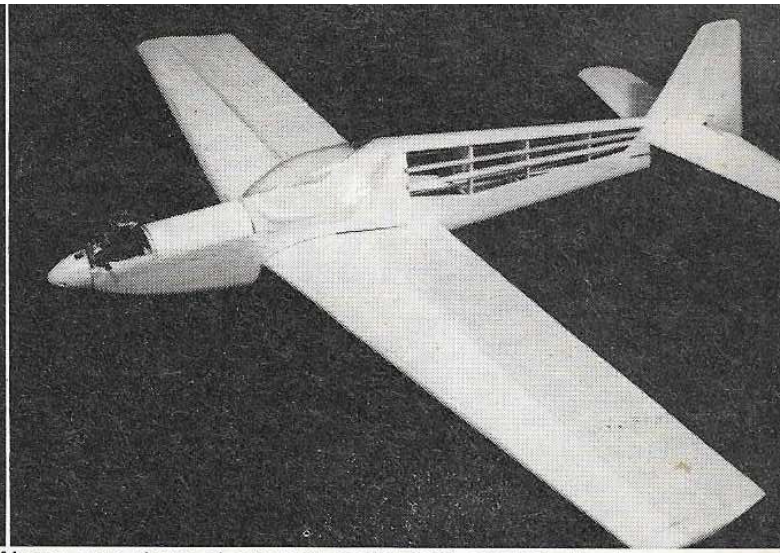


Top left: basic fuselage is built flat on built-in board. Structure is assembled on the fuselage floor. This view shows basic fuselage minus one side, left off to show formers supported temporarily by gussets. Second left: same stage of fuselage construction viewed from front. Third left: Fuselage with sides fitted plus tail surfaces in place. Bottom left: Basic wing structure before sheeting. Above: our test model had fully sheeted wings. Sheeting is seen here cut to shape ready for fitting.

I had a world beater with the new 'Slik-Fli'. The model was smooth, stable, and very responsive. These tests however, were during an unusual spell of weather where conditions were quite mild without the wind and turbulence common to our local flying field. The coupled flaps made the Slik-Fli very impressive in sharp turns and manoeuvres such as square loops. They also seemed to keep the model flying at all times without any tendency to mush through manoeuvres. The big disadvantage was in landing as they caused the model to float almost unbelievably. An electronic switching arrangement was added to the receiver to permit the flaps to be cut in and out at will. With more and more test flying, I began to have serious doubts about the advantages of the flaps. A very noticeable disadvantage was the non-linearity of elevator response. Apparently, the flaps were not very effective with small elevator movement, but became increasingly effective as they were moved further. This might seem to be an advantage, but I did not find it so in practice. I experimented at length with different amounts of flap movement in relation to elevator and arrived at a relatively small amount of flap movement as being the best overall compromise. I was still undecided as to whether the flaps were an advantage or not until I flew the Slik-Fli in its first contest. By the time it had been driven 400 miles to the contest, the flaps were banged out of adjustment and, I never did succeed in getting the aeroplane properly trimmed during the meet. Even though the







Above: two views of our test model built specially for the series. Note fully sheeted wings. Sheeting of fuselage sides just behind cockpit differs from arrangement shown on plan. Sheeting shown on plan considered necessary for strength – 'we're not all as good as Phil on the box are we now.' Upright engine shown here.

handling of the wing was undoubtedly carelessness, it was apparent that the flaps were another surface which could easily get out of adjustment and therefore, detracted from the consistency of the aircraft's performance. I would suggest that those of you who build the Slik-Fli, give the flaps a try. Certainly, it's an interesting experiment, and if nothing else, you can impress your friends with square vertical '8s' at one quarter power. While I have abandoned the flap idea for my own use, I certainly would not call the test on the Slik-Fli conclusive.

As to the midwing design, it seemed to work well enough on the Slik-Fli except that the long landing gear was a definite disadvantage. Also, some air cushion was lost during landing. Structurally, the midwing complicates things a bit, mainly in respect to producing an inherently weaker fuselage design. Frankly, I can see absolutely no advantage to the midwing from the flying standpoint. Another later design showed a definite disadvantage to the midwing layout as it put the stab too close to the wash off of the wing making this later design very unstable longitudinally. It would appear that it is desirable to have the stabiliser off-set as much as possible from the wing centre line. This is particularly true with relatively short tail moments and very thick wing sections.

As mentioned, the testing of the Slik-Fli had been done mostly in calm weather. The first contest entered was the Winter Nationals at Tucson, Arizona. The weather was very windy and turbulent, and under these conditions, the Slik-Fli was anything but a success. At least on this design, the tapered leading edge wing seems to contribute to buffeting from gusty winds. Also, the first Slik-Fli had more dihedral than I normally use, which didn't help matters either. (*Editors note – my own Slik-Fli built without flaps and with shallow dihedral as shown on the plan proved to be just about the smoothest aerobatic model I've ever flown. Certainly superior to either Bar-Fli or Kwik-Fli III – I have both. In fact, I was so pleased with the performance, I will have two identical machines for the* 1970 *contest season*).

I had always been curious as to the merits of the symmetrical stab versus the flat stab. The first Slik-Fli had a bolt on the stabiliser arrangement which permitted either type to be flown. The flat stab is much more sensitive around neutral and touchier than the symmetrical stab. The symmetrical stab had an aerodynamic dead band which I personally dislike. My good friend, Cliff Weirick, thought just the opposite as he greatly preferred the smoother, less touchy elevator response with the symmetrical section.

To sum up the Slik-Fli design, it actually is a very good flying aeroplane as shown on the plans. I think that you'll enjoy experimenting with the flaps. The basic fuselage layout proved to be very good and, I am convinced that the large lateral area is very desirable on a contest multi ship. This has been proved on many previous designs including the 'Bar-Fli'.

A new low wing Slik-Fli is in the construction stage employing the Mark IV 'Kwik-Fli' wing. This wing has a fairly thick 18 per cent centre section and 15 per cent tips. It is of the conventional double tapered leading and trailing edge rather than the swept leading edge. Incidently, Larry Leonard used this Mark IV 'Kwik-Fli' to win the U.S. Nationals. I also want to try a lower aspect ratio tapered wing just for the sake of experimenting. Maybe eventually we'll come up with a better overall design. My 'Kwik-Flis' are about worn out anyway, and the results of the Internationals indicated it is time for a change.

Below: three views of Phil's prototype Slik-Fli, tested with two types of wing sections and with flat plate and fully sectioned tailplanes. Phil prefers flat plate section on tailplane. Colour scheme is Phil's usual orange and blue, with white cheat lines. This colour combination provides excellent visibility in the air, so essential for contest flying.