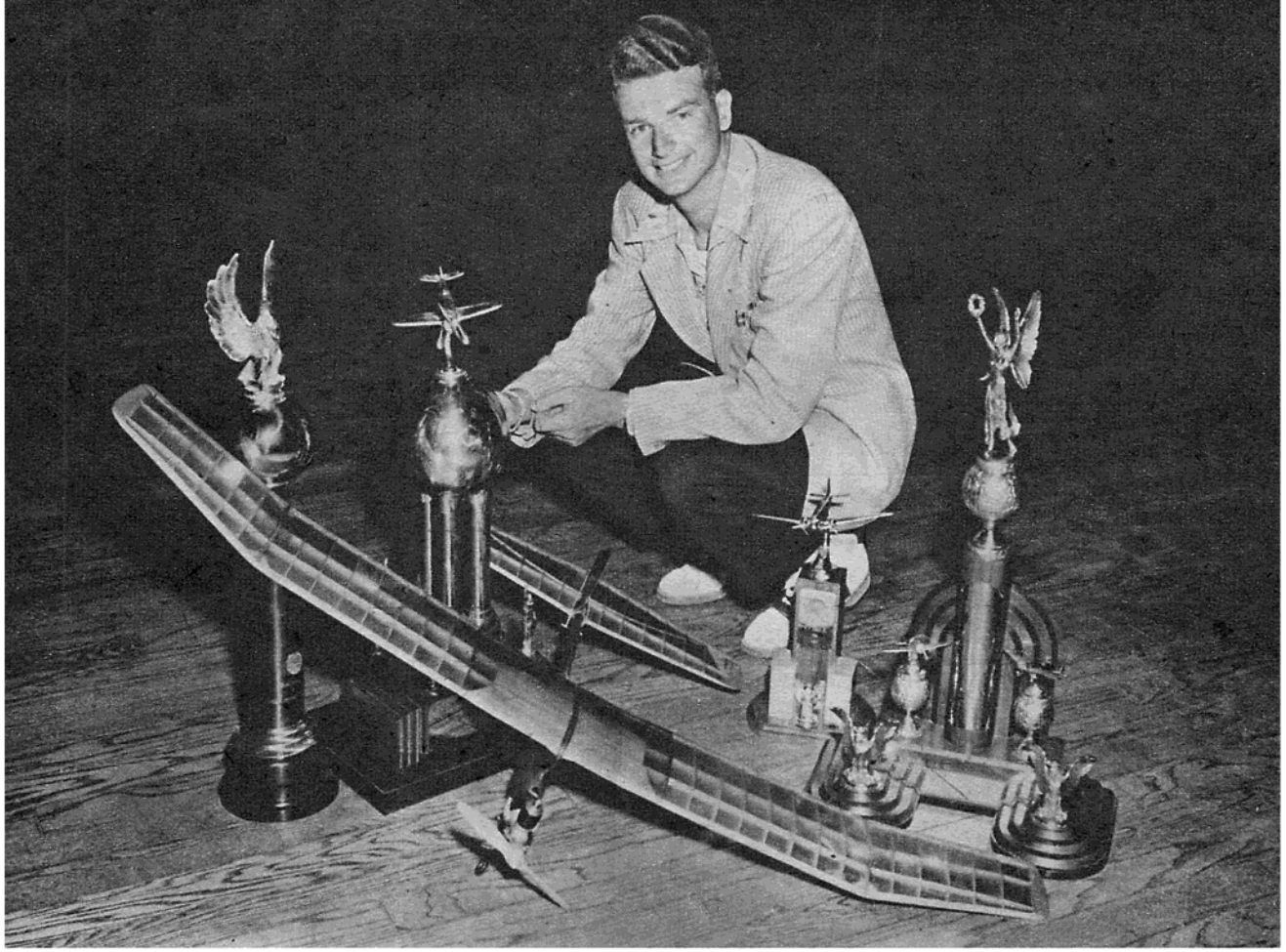


● Designer Norris and some of the trophies his Class A job helped him win at the '48 Nationals where he captured Senior Class Champ title.

Blitz Buggy

By JACK NORRIS

This plane has racked up an impressive list of National and Plymouth meet victories

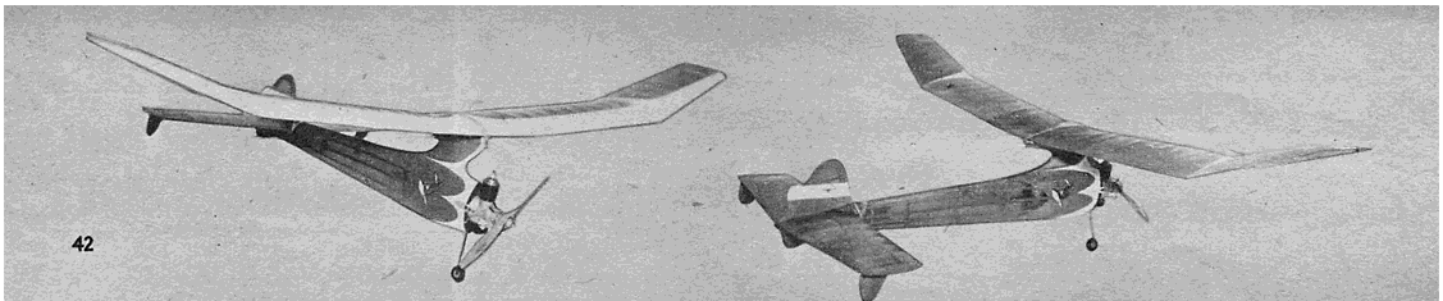
UNLIKE most models the Blitz Buggy was not designed, it was developed. For the past seven years we have made an effort to produce a free-flight design that would answer the demands of competition. From experience we have found this necessitated constant attention to practical aerodynamics. The result is a model that has won the Plymouth Internationals, the Philadelphia Flying Circus, the Scripps-Howard Junior National Air Races, and two classes at the 1948 Nationals.

Through association we have developed a keen respect for the modeler's ability to follow plans. We have planned, therefore, to omit the usual description of construction details. Instead, we have decided to give a summary of the basic design concepts incorporated in the model in an effort to make the material more interesting and instructive to the reader.

The design of a contest free-flight model, like any other engineering problem, requires constant compromise. By practical aerodynamics we mean a balance of those factors which produce the three goals of free-flight design: efficient flight characteristics, stability, and ease of construction.

The factors which produce these characteristics are often so closely related that instead of blunt compromise, it is often possible, through thoughtful design, to fulfill two, or perhaps three, of these goals with one idea. As a practical example of this, streamlining will almost always enhance appearance and flight characteristics. By the use of some ingenuity in design, construction methods may be incorporated which give good streamlining

● Full size plans for building the Class A Blitz Buggy are available from Air Trails' full size plan service. Use coupon in back of issue.



and "A-B-C" construction throughout.

The factors which actually produce good contest characteristics are often so elementary in principle that they are overlooked in the quest for something difficult. Some of these factors are as follows:

Planes with short bodies and large tails can be controlled quite efficiently; yet they have that degree of longitudinal instability which allows them to "jump" on practically any rising air current. As a result they stay up longer and win contests.

Designs which place the center of side area of the model on a level with the center of gravity do not tend to be upset when the model slips sideways in a turn, and therefore do not go into a spiral dive.

Bodies with large side areas may be observed in the air longer than pencil bombers and consequently win more contests—other factors being equal. Wings with less dihedral, which may be used if the center of lateral area is carefully placed, do more lifting and less dragging. Long thin wings with properly designed square tips are easier to make and are more efficient than stubby or even tapered wings.

Strong models covered with silk last longer and can be better and more consistently adjusted. Planes with dethermalizers *that work* not only can be retrieved more often, but can be retrieved sooner so that your flying can be concentrated during the best part of the day.

After many years of building diamond-shaped fuselages, elliptical cross-sections, and even boxes, we arrived at the present lateral-crutch construction which is quite simple, yet surprisingly efficient. The type of formers used practically eliminates fitting and plotting of shapes yet gives very good streamlining.

The use of large construction components lowers the number of parts necessary while it increases the resistance to warping. Warps are one of the biggest factors in decreasing performance and should be avoided at all costs.

Before beginning construction it should be decided if glow plug or regular ignition is to be used. If a glow plug is used, the gas tank may be mounted internally and the indicated cowling added. The use of slightly larger leading and trailing edges on the wing and tail will increase strength and help to rectify the weight and balance change caused by the elimination of the ignition. If on the other hand a regular ignition system is used, as it was on the original model, care must be taken to keep the ignition layout as thin as possible so that it can be readily removed from the fuselage. We advise the use of a ⅛" x ½" maple ignition track. In a crash this will transfer the shock to the firewall and the coil won't be found leaving by the "side door."

It is advisable to use firm straight-grained balsa on all parts unless otherwise noted.

Fuselage construction is begun by laying out the 3/16" x ⅜" backbone and adding the pylon core and the plywood tail stiffener. After the formers are glued to one side, the body may be removed from the plan. The formers of the other side and the wing and tail platform may then be placed. Adding the planking, stringers, fillets, and firewall ring will complete the body construction.

The wing and tail are of simple construction and require little explanation. The use of a plywood or tin rib-template will cut building time in half. Plenty of glue at dihedral breaks and good straight-grained wood will greatly improve the strength and resistance to warping.

The dethermalizer is the biggest asset of a good contest ship but seems to give a disproportionate and unnecessary amount of trouble.

We have chosen the "pop up tail" type to eliminate the use of hanging strings and complicated lever systems. The angle used here is very important though not overly sensitive. Too low an angle will produce a spin while too high an angle will give a brick-like descent. At optimum position, usually about 40°, the model will turn into the wind and settle quite slowly, hence adding to the flight time and often giving the winded modeler time to get to the landing spot before the model.

Release mechanisms seem to be the big bugbear due to the low force exerted by the pneumatic timer. This trouble is eliminated by two very simple principles. Make the release mechanism as smooth and simple as possible to reduce friction, and be sure that the pivot point of the tail is almost in the straight line of the tail-holding rubber bands. This gives assurance that the rubber bands will "hold down" the tail and not "hold back" the dethermalizer.

The dethermalizer timer is placed in the front of the model between the second and third former where it may be removed for adjustment whenever necessary. It is best to adjust the dethermalizer for about 10 minutes. If a shorter run is desired, allow the timer to run for a few minutes before launching. If a longer run is desired, an extra rubber band or so may be added to the tail pivot thereby slightly increasing the dethermalizer friction.

There has been much research done on undercoats for lacquer finishes but the best undercoat for clear dope is still *sandpaper*.

Because it is more resilient, silk will often help models last twice as long and is therefore well worth the slightly greater investment required.

Several coats of thin clear dope will assure a low drag covering and add immeasurably to the performance.

Flying: here we are around to that interesting part again. I'm not going to tell you that you shouldn't test the model with the motor wide open on a windy day with lots of thermals, because I know that *you* wouldn't do a thing like that. I will, however, recommend that you do use that rare quality—common sense, and also take your time. The model is quite large for a class A ship but with an Arden 19 it really "moves."

We have always flown our free-flights in a medium tight right climb with a tight left glide and so far have had good results. The original model flew with the indicated incidence and downthrust and 4° right side thrust. We found that a 9-8 Power Prop allowed the motor to "turn up" enough to approach its optimum horsepower in a fast climb.

Blitz Buggy is quite stable and little trouble should be encountered in bringing it to high performance. We have always noted, however, that the consistent winners have their models well tested and know exactly what the model will do when it is launched.

CLASS B BLITZ BUGGY

Author Norris says anyone can turn out his winning Class B version of the Blitz Buggy by multiplying all dimensions given for the Class A job by 6/5. The only change in the design is that the flat center section is left out of the wing giving it a span of 60 inches.

Using his B class DeLong-powered job, Norris took a 1st at the 1948 Nationals, 1st at the 1947 Plymouth Internationals, 1st at the 1947 Scripps Howard Junior National Air Races, 1st at the 1946 Philadelphia Flying Circus—to mention only a few of its top places in scores of major meets.