

VARI EZE



By HANK NIXON . . . After flying this or any canard, you'll wonder why the "tractor" has become the convention. The short fuselage handicaps rubber duration, but the stability doesn't know when to quit!

• The Rutan VariEze is the most exciting homebuilt since the BD-5. It offers very high performance, economy, and ease of building . . . a homebuilder's dream. Originally Volkswagen powered, it now uses the same 100-hp engine as the Cessna 150, and has a primary structure of urethane foam and fiberglass-reinforced epoxy. This revolutionary airplane has sparked the homebuilt world, and dozens are now under construction.

Choosing the VariEze as a subject for a Peanut Scale model was not done with dreams of the ultimate competition model. It was built to find out if this very interesting machine could be made to fly well. My prototype has proven to be the most stable Peanut I've flown. Pitch stability is excellent, due to the fact that if the nose gets too high, the canard always stalls first, due to it being at a higher angle of attack than the main wing. This then drops the nose, causing immediate recovery.

The high amount of sweep, combined with the winglet design, gives a high

degree of roll stability, even when near or at the stall point. In hundreds of flights, my VariEze has never failed to land on the gear except when it hit something. The duration performance is a little less exciting. Mine gets about 10-12 seconds hand wound, and has gotten 17-20 seconds when using a winder and well-lubed fresh rubber. The main reason for this performance is a fairly heavy wing loading, even though mine weighs in at 8 grams including rubber. Some liberty was taken in increasing the area of the wing and canard to reduce the loading. Scale outlines are shown with dotted lines.

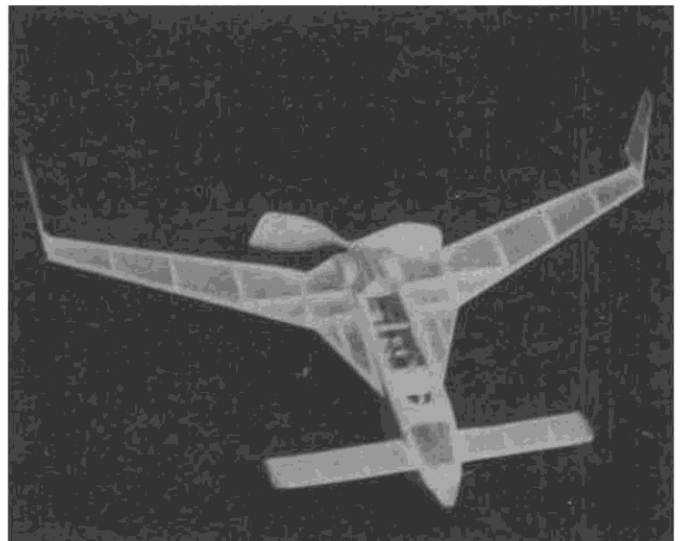
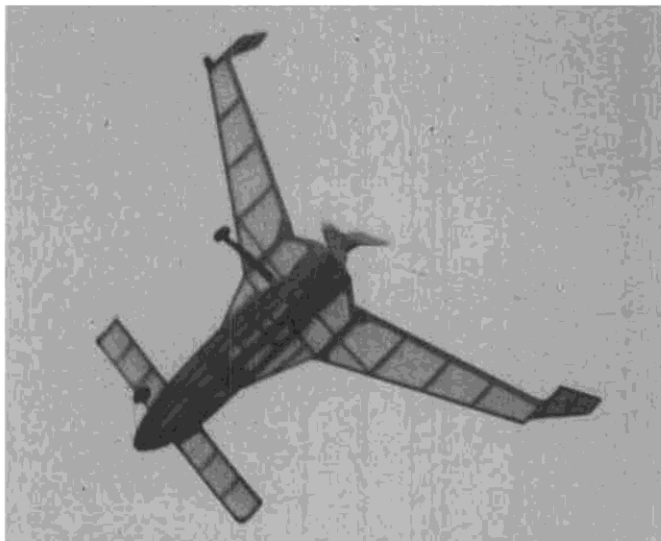
Construction should begin with the fuselage, since it is most of the work. Begin by making two sides over the cross-hatched lines. The longerons look big, but some material is removed during shaping, and they should be made of fairly light wood to allow enough flexibility for the sharp bends. The sides are next brought together with cross pieces at stations A, B, E, and the

former at G. Wetting the sides will help in bending.

After this has dried, add the remaining formers and nose pieces. I use a small razor saw to notch the formers after they are in place; I break fewer pieces that way. Next, add the light 1/16 sheet top piece from former B to the rear of the canopy and add stringers to the bottom. Stringers for the turtledeck are sliced to shape from 1/20 sheet. Some careful sanding will now bring the fuselage to shape.

Form the nose gear from .012 wire and glue to the inside of the nose bottom sheeting. The main gear shape is unusual and is best made from a piece of .008-.010 aluminum, sanded to reduce weight. Wire axles are then glued and bound to the gear. Install the main gear by gluing it directly to the lower longerons, and add the 1/32 sheet filler below. Note that this is probably one of the first times a fiberglass gear has been copied on a

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In contrast to most Peanuts, which feature gobs of wing area, the VariEze has a rather minimal amount, which increases the wing loading and results in a faster flying model. Simple construction is evident in these photos.

model in aluminum!

The wings are straightforward. Do everything possible to keep the tips light, as they are far behind the Center of Gravity. The same goes for the winglets.

Canard construction is unusual, in that for a change, you can build a heavy "tail". If you don't use the dowel for the leading edge, use very hard balsa, because the canard takes a lot of abuse when the VariEze flies into things. The sliced ribs with undercamber are important, so don't cheat here. A possible substitute would be solid sheet with the camber warped in.

Covering is a little tricky on the fuselage. Use small pieces and work slowly. Cover the top of the wing strake separately from the rest of the top, to reduce wrinkles. Make sure the tissue on the bottom of the canard is well attached to the ribs.

Assembly has no real tricks. The only unusual thing here is no dihedral. Note the outward-canted winglets. The cowl parts are formed from 1/32 sheet bent to shape before assembly.

Form the canopy over a balsa or basswood (preferred) mold. If you get a small wrinkle or two, an electric iron as a heat source and a cotton glove come in handy for rubbing these out. Don't forget the pilot!

My wheels are balsa with small .005 aluminum washers for bearings. These are colored with a black felt pen. The small amount of trim is red. My prototype has one coat of dope thinned 50-50 on the flying surfaces and 2 coats on the fuselage, which gets handled most.

The prop shown is the third one I made, each with more blade area. It is far superior to the small plastic ones that were tried on this model. Keep it very thin, as it adds weight behind the Center of Gravity.

Balance the model at the point shown on the plan. If the canard incidence is as shown and there are no warps, it will fly right off the board. Turn can be trimmed with the winglets. Use thrustline adjustments for power path to get maximum climb. Canard adjustments should only be used if the bird is really out of trim.

I'm sure you'll find the VariEze to be a lot of fun to fly. Good Luck. ●