

Photos by Jack McConnell

# The "Face Saver"

by Larry Kruse



**It rolls with the punches. This windy-weather Handlaunch scores high in turbulent air. You need one in your stable.**

During the course of last year's contest season flying Hand Launch Gliders, it became apparent to me that on more than one occasion I was doing something wrong. Even though trophies were not impossible to come by, at times I found myself taking home seconds or thirds or nothing, instead of the numero uno I had anticipated.

In re-thinking those contests that hadn't gone well for me, the only constant factor in my inconstant performance that seemed to be affecting me (other than pattern baldness and advancing senility) was that of wind velocity. In each contest that I had not measured up to my own expectations, the wind had really been whipping.

In addition to my own inconsistency, it didn't seem that the design I was flying

was turning in the consistent performance in the wind. The buffeting 20-25 mph gusts provided simply was not conducive to the plane's best flying characteristics.

About the same time I was trying to evaluate my problems in contests, I had the pleasure of flying twice against Ray Harper, probably the hottest name in HLG's in '73. Ray spent the entire contest season collecting first place hardware, literally from coast to coast. At the time of our second meeting, Ray had just won the Max-Men's Annual, the Nor'Wester's Annual, the Eastern State's Championship, the Tulsa Glue-Dobber's Annual in addition to seven or eight local meets in California. Needless to say, he was primed to continue his winning ways.

Unfortunately, a major airline decided to intercede by using Ray's shipping box as an experiment in mishandling baggage, the result of which was the destruction of all except one of his ships. During the contest Ray had to overcome some real difficulties flying in excessive wind with an airplane inappropriate for the prevailing conditions.

Even though neither of us performed up to our own personal expectations in this particular contest, the experience did provide some positive insights. Ray's large experience in flying in all types of weather and topographical locations, and our subsequent discussions about HLG design seemed to point up the need for at least one ship in each competitor's stable designed for

extreme conditions, if for no other reason than to save face in a trying situation.

The "Face-Saver" was designed specifically for such a situation. Based on the premise "the higher you throw it, the longer it takes to fall out of the air," the plane is a member of the "all or none" family of Gliders. It's meant to get up where the lift is (if there is any) and bounce on the wind gusts as long as possible in order to catch good air. As a calm air competitor, it ranks in about the same category as the center leaf of your kitchen table, but in zephyrs over 5 mph, it does what it's designed to do.

Being a windy weather bird, the "Face-Saver" has several features worth pointing out. The most noticeable one is what appears to be an almost excessive amount of dihedral. The dihedral angle provides the inherent stability necessary for handling wind. Instead of spinning in as some polyhedral ships tend to do in gusty conditions, the "Face-Saver" rolls with the punches, so to speak, and simply rocks with the gusts in a side to side motion. The dihedral also provides for an almost automatic roll-out at the top of the launch, offering a great advantage in gaining altitude as will be detailed in discussing the launch technique.

The design employs a  $\frac{1}{2}$ " sweep per wing panel, a feature which not only complements the dihedral effect, but also assists in wind penetration. The relatively thin airfoil and the swept wings allow excellent altitude to be achieved on nearly every launch. The short wing span and generous chord aid in launch acceleration without penalizing the glide to any excessive degree.

### Construction

One added advantage of the plane which becomes evident in beginning construction is that of economy. You can get two complete sets of wings out of every  $\frac{1}{4}$ "x4"x36" Sig taper sheet-or a whole season of gliders for under five bucks.

Cut the wing blanks out of  $\frac{1}{4}$ " taper stock or  $\frac{3}{16}$ " non-taper. Either way you'll have some sanding to do. Plane and sand each wing blank to the airfoil shape shown on the plan. Use a template to insure accuracy. Taper the tips to  $\frac{1}{32}$ " or less to center the mass of the wing over the fuselage. Sand in the necessary dihedral angles in each panel and epoxy the panels together.

The fuselage is cut from  $\frac{1}{8}$ "x $\frac{3}{4}$ " straight-grained Sig spruce and the nose doublers are cut from  $\frac{1}{16}$ " Sig plywood. Remember to cut the D-T weight notch into the left doubler before epoxying it to the fuselage. Round the fuselage and sand it smooth after the epoxy cures, except where the wing and stabilizer are to be attached. Taper the width of the tail boom to  $\frac{1}{16}$ " at the rear.

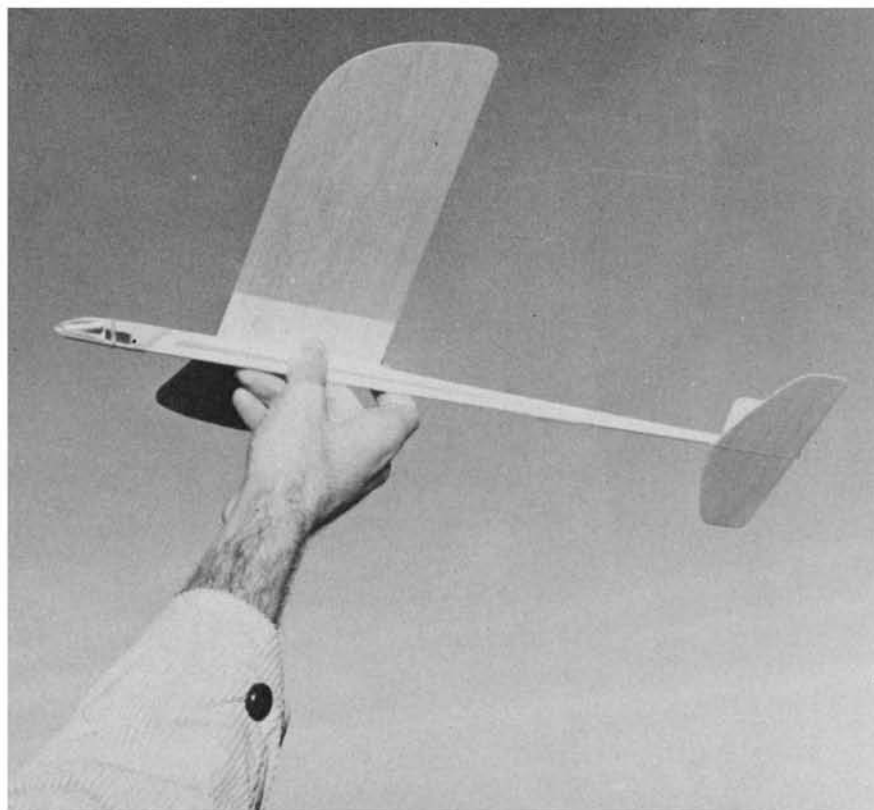
The rudder and stabilizer are cut from light  $\frac{1}{16}$ " C grain contest balsa and sanded to airfoil shape. Pay particular attention to thinning the trailing edges of both so that small adjustments can be tweaked in without cracking the wood.

Use Hobby Pox Formula 4 to attach the wings to the fuselage. Block up both the fuselage and wings to assure accuracy. The finger-rest is made of  $\frac{1}{4}$ " balsa scrap and may be mounted on either side of the wing-fuselage joint. Glue the stab and rudder.

FLYING MODELS



Wind is a constant companion. Larry feels you've got to live with it, fly in the air you have, rather than the air you would like. This ship recovers from the gusts and aids your chances at a contest. Flag trimmed for O.O.S. intercontinental thermals. Below: Grip it so. Note the D/T.





Superb flag-like finish went to his head. David McConnell is set, enthusiasm is half the battle. The "Face Saver" is a practical bird which seeks the elusive thermal in less than perfect air.

der to the tail boom. The stabilizer should be tilted up  $\frac{1}{4}$ " on the left side, as viewed from the rear for a left glide aide.

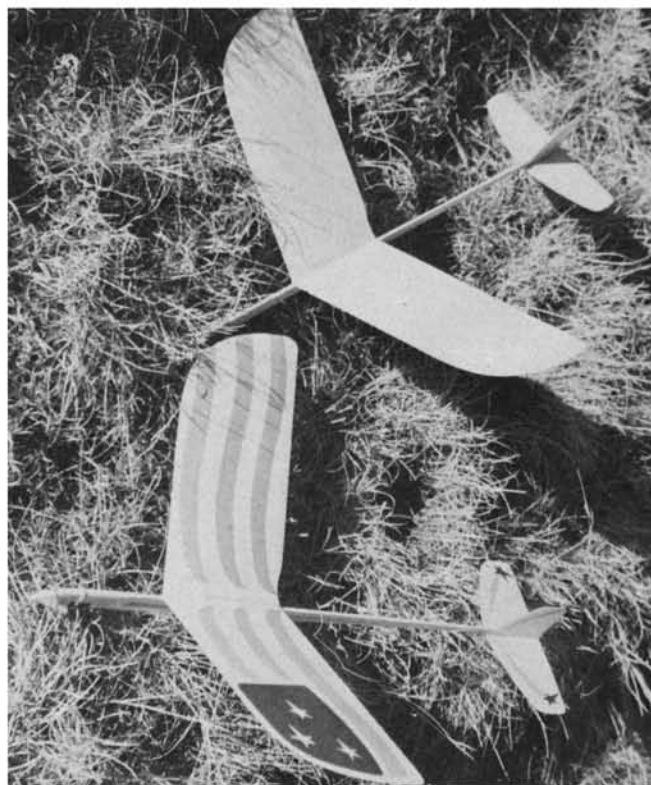
The entire plane, including the tail surfaces can now be given two coats of Sig Lite-Coat, thinned 50%, followed by two or three coats of thinned sanding sealer on the wing and fuselage only. Sand down to the bare wood after each coat of sanding sealer to fill the wood grain and to avoid building up unnecessary weight. Finish off (a bad phrase) the plane with three coats of Lite-Coat on the wing and fuselage, sanding with No. 400 sandpaper between coats.

Due to the diminutive size of the plane, I also use a fluorescent red or orange (either tissue or paint) on the underside of the wings to improve visibility.

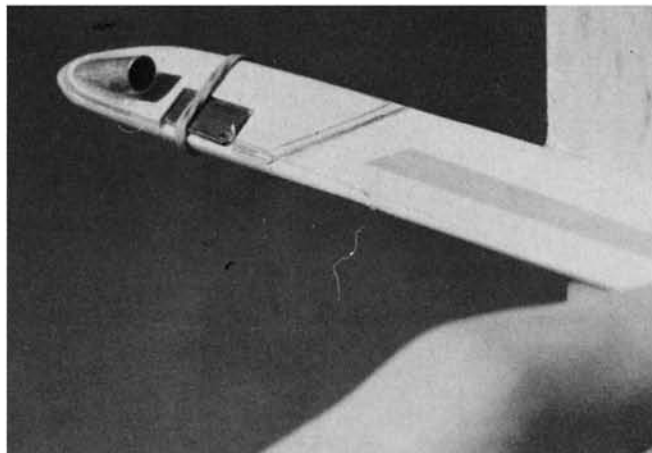
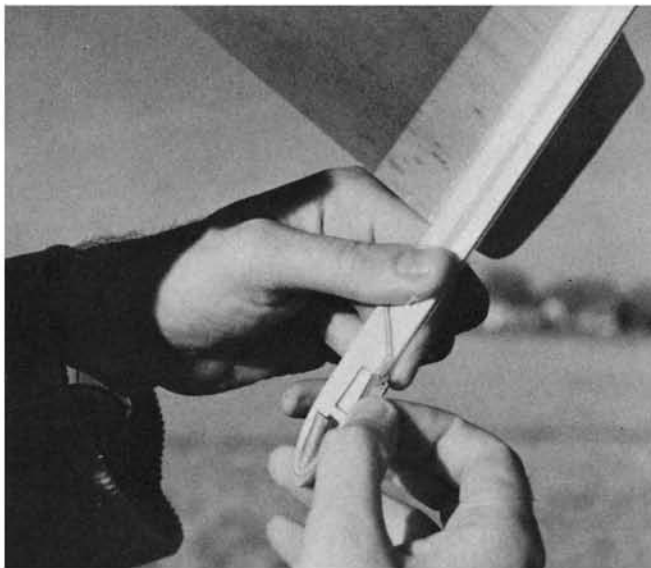
### Launch Technique

Balance the plane at 50% of the wing chord. Even though the plane eats up windy weather, the first few test tosses should be done under calm conditions to be certain that your plane doesn't have any built-in death wishes. Any bad tendencies that show up in calm air flying will be greatly amplified in the wind.

The best launch for the design is not the typical "Texas" style, banked into a right hand power pattern and a left hand glide circle. The "Face-Saver," with its inherent stability, can gain the extra altitude of an almost vertical launch. As high and as hard as you can throw it, if you like. Many HLG's must be thrown right "in the groove" with a very controlled launch before they'll transition appropriately. This ship can be launched between  $70^\circ$  and  $80^\circ$  straightaway—no bank to the right or left. At the peak of the launch, the dihedral, stabilizer tilt and a very small rudder deflection to the left will flip the plane over directly into its glide path. Its



If one is good, two are better. Spares guard a guy's chances when ground fractures your hopes. Left: Deep grass is nice beneath the testing ship.



Close in look at the D/T. When the Kansas boomers play vacuum cleaner, only your fuse will save the day. A burning fuse severs band, drops weight on line, knocking all out of flight balance. First you've got to park it into lift, and that takes good launch technique. Strive for height.

"groove" is not at all critical, in fact, it can handle almost any kind of launch and still transition effortlessly. Brute force is an advantage with our bird.

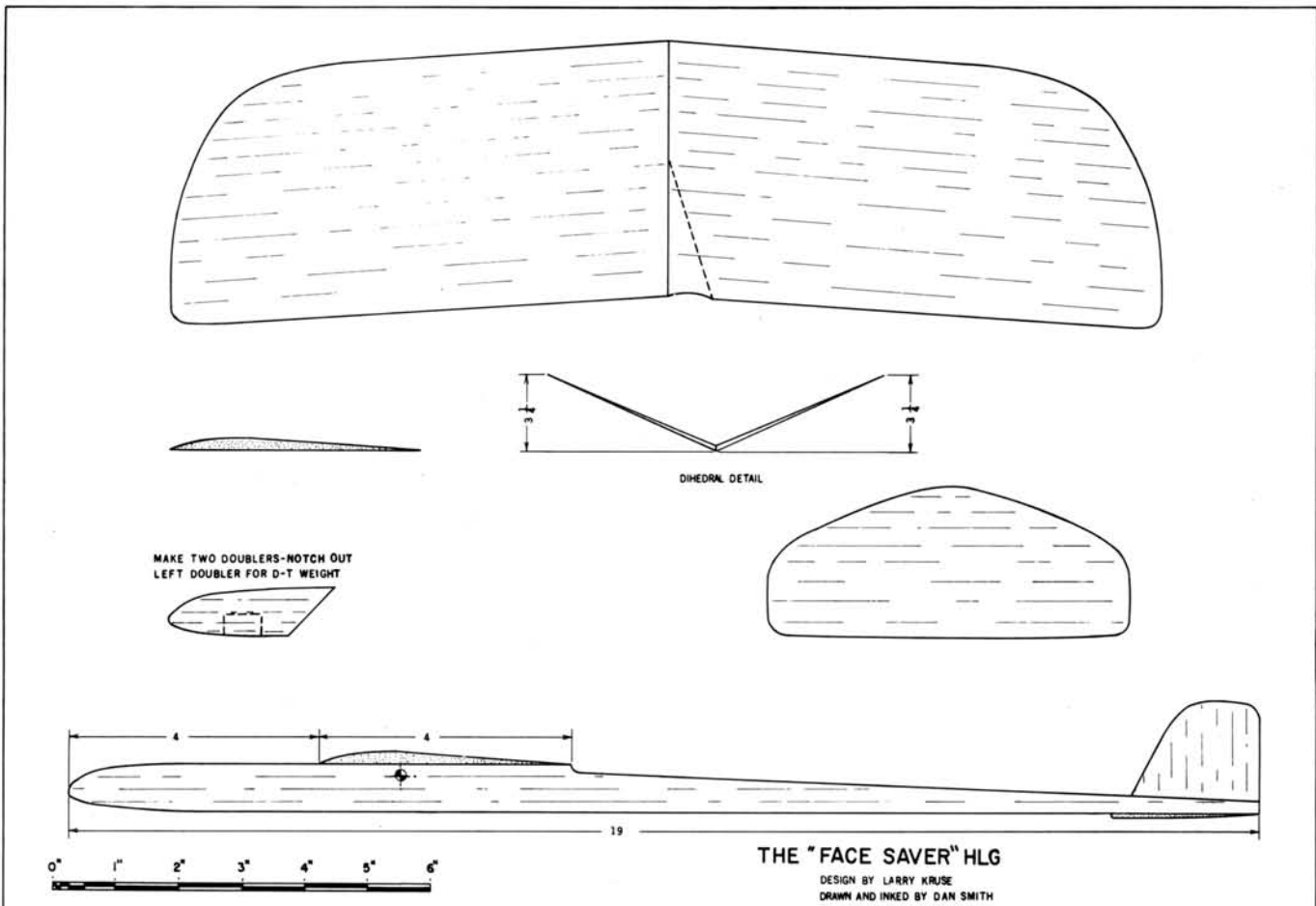
If the plane is trimmed carefully, you won't have to guess how far downwind the thermal bubble has blown on a windy day. Because of its excellent transitional ability, you can throw the plane straight up into the middle of good air as soon as the mylar streamer rises, and not be afraid that it will spear you in the posterior before you can straighten up from the launch.

The plane has been flight-tested extensively since late October in cold air and windy conditions with good results. As an example of the type of performance you can expect in the wind under essentially non-thermal conditions, the following information was logged on November 17, 1973, typical of many such test days.

Air Temperature: 41° Time: 10:30 a.m.  
 Wind Velocity 12-18 mph S-SW  
 1st flight—1 min. 17 sec.  
 2nd flight—48 sec.  
 3rd flight—3 min. 48 sec. (O.O.S.)

One of the problems evident with the design during flight testing has been the loss of five ships, all thermaling out of sight. There are certain problems you learn to live with, however. I would prefer to live with a problem of a tendency toward O.O.S. flights rather than a problem of never catching a thermal.

The "Face-Saver" is a good ship to have on hand in the wind, or out of hand as the case might be. Hopefully, the plane will be a welcome option for you this contest season.



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