



AM CONSTRUCTION FEATURE

*Cliff Weirick and Larry Leonard with 'Das Liddle Stik's' at Universal Studios.*

# Das Liddle Stik

By Larry Leonard



**A**LMOST two years ago, Phil Kraft, threw caution to the winds, his french curve in the trash, sophistication to the side, and beauty of line someplace that hasn't even been discovered yet! The end result of his labors (?) was the Ugly Stik. As could be expected, after a quick (or is it kwik?) glance at this project of a proficient modeler, the Ugly Stik was an immediate success. Not only was it a fine flying machine, but it could be built very kwikly (naturally) and it is of the category often described as "it's so ugly that it's cute!" Jim Jensen then produced one of his beautiful kits of this airplane and its success was assured.

Larry Leonard, proprietor of a local hobby shop and a very active flyer, and Bud Anders, (both of the Valley Flyers R/C Club) built and flew the Ugly Stik and both liked the airplane very much. Then the idea came to them that this ship might be even more fun if it were to be reduced in size. They, then, would have a more compact airplane, which would, hopefully, provide even more fun. These two intrepid modelers decided that a 25 per cent reduction in size would provide a nice, small air-

plane with enough wing area remaining to keep it airborne. Here serendipity entered into the picture. With much acumen, the plans were reduced to  $\frac{3}{4}$  size, the structure was modified to fit the reduced size of the airplane, and the elevator was slightly increased in area to provide the proper response. Now hear this, fellow modelers. When a wing is reduced to  $\frac{3}{4}$  of its original size, there remains only  $\frac{9}{16}$  of its original area. Ergo, the reference to serendipity. The airplane, never having been schooled in mathematics flew like a dream. It ignored its high wing loading and even retained the glide. True, more than  $\frac{1}{8}$  of an inch movement either way of the ailerons would produce angular accelerations of an unbelievable magnitude, but the sophisticated solution to this problem was finally derived, lengthen the aileron horns.

While cutting out the parts for the first "Liddle Stik," Larry Leonard decided that it was almost as easy to cut out six models as it was to cut out one. As a result of this logic, the original sextet was built by Larry, Bob Golden, Dick Adams, Mike Bainum, Jim Boylan, and the Valley Flyers answer

to Harold Goldklank — Les Kesner — all members of the Valley Flyers. The equipment utilized has ranged from six channel reeds to full house proportional, although there is no reason why this would not make a good GG ship. Considerable success has been recorded by each airplane insofar as qualifying as a real fun aircraft.

The Liddle Stik has been flown as a tail dragger, or trike geared; without dihedral; with ailerons, without ailerons; and even without a working receiver (need I say whose?). It has been powered by a variety of engines ranging from .19's to — would you believe a Supertigre .56? It has been fitted with almost every type of radio equipment imaginable and most rigs will fit with a little planning. Larry's prototype sports a Supertigre .35 in the nose, four channels of a Kraft KP6B inside, and weighs about  $3\frac{1}{2}$  pounds dry!

The airplane is a fast, smooth flier, and although it was designed primarily as a sport ship, it will do both full AMA and FAI patterns with no strain. I've also seen it put through virtually every free style maneuver there is and it does them all!

*Build it as a tail dragger, or trike geared;  
without dihedral; with ailerons, without  
aileron; six channels or full house;  
.19's to .45's.*

The ship snap rolls particularly well, and it will do nice, tight loops with a full snap at the top mighty fast. The vertical capability seems endless due to the light weight and the .35 in the nose, and it will climb out of sight in a hurry. As a tail dragger, it tracks well if one remembers not to slam the throttle wide open on take off, and the landings and taxi-back's are as good as any molded ship can do.

All in all, it seems that this experiment in smallifying an existing design has been most successful. So successful, in fact, that Larry is now kitting this ship for local consumption. This experiment also gives a good indication that there is still a lot of fun left in this hobby, for Larry Leonard is fast becoming a noteworthy contender in Class 3 Expert events. This can be attested to by his eighth place finish at last year's FAI finals and his fifth place finish at Los Alamos Nationals. Pattern flying may be great, and there is no denying the skill that is required to fly the pattern well, but there is always a time and place for just plain sport flying.

#### CONSTRUCTION

If you are one of the many hundreds of modelers who have built one of the full size Ugly Stiks, then there will be little need to read the following brief construction note. This miniature version follows exactly the same construction procedure as did its larger counterpart. Only the balsa sizes and overall dimensions are changed. Unlike the

great majority of contest type aircraft, if you are a beginner, don't go away! The larger version was an excellent full house trainer, and the Liddle Stik is no exception. Don't, however, make the mistake of putting a .45 at the nose, ala Cliff Weirick and expect it to be a docile trainer. It won't be! With a .19 engine, however, it will fly quite well and provide you with a great many hours of flying pleasure while, at the same time, you learn to become proficient at the art of flying full house proportional.

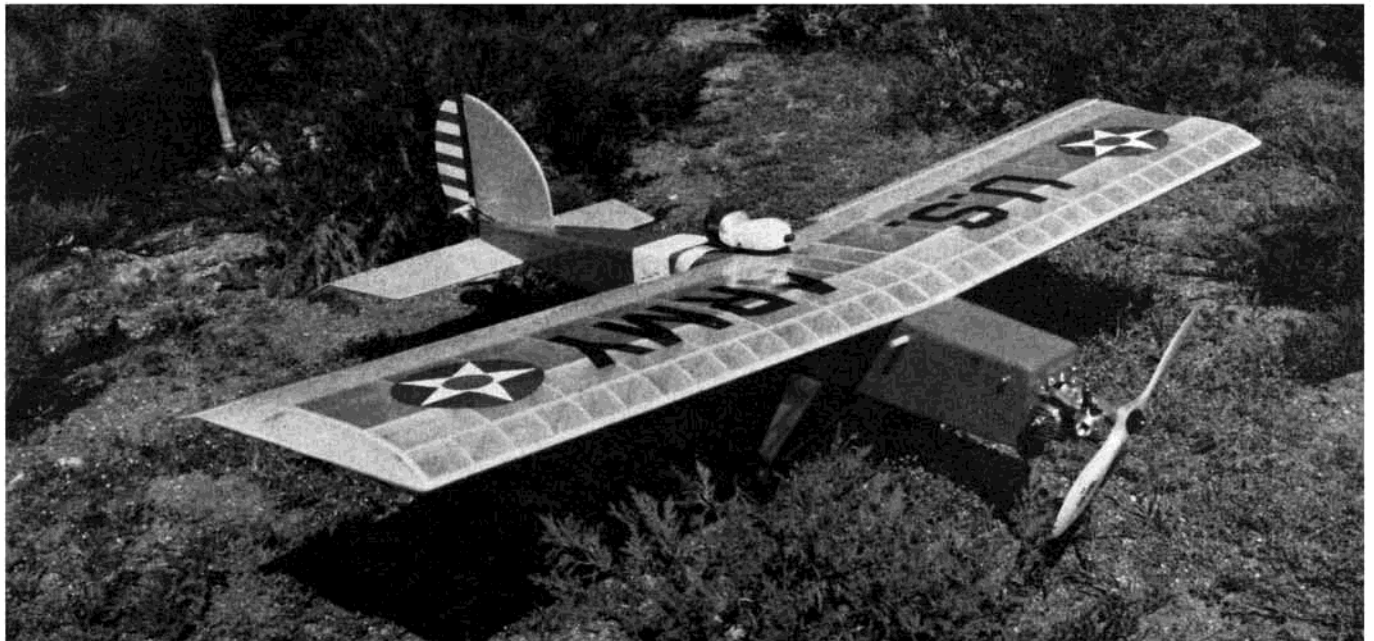
Before commencing construction of this model, decide whether you are going to build the trike geared version, or the tail dragger. Next, decide which engine you are going to use. Anything in the range of from .19 to .35 is within the realm of reason. Below or above these two categories, however, you are on your own! Construction notes here will be limited to "handy hints," since the overall construction of this model is simplicity itself.

Begin construction by cutting out all the parts that are to be used in the airplane. This includes all fuselage parts, wing ribs and spars, sheet tail surfaces, etc. Lay the plywood fuselage bottom down on a flat working surface and butt glue the balsa fuselage bottom to it. Mark the positions of all formers and glue them in place using Titebond glue at all former locations with the exception of F-1. F-1 should be glued in place with Epoxy glue. While the fuselage formers and bottom sheeting is drying,

assemble the stabilizer tips to the stabilizer proper. When completed pin the stabilizer down and butt glue it to the rear of the fuselage bottom. When the fuselage formers have dried, apply Titebond glue to the bottom of the fuselage side, bottom sheets, bulkhead and stabilizer. Spread Epoxy on the fuselage sides in F-1 bulkhead where the sides join that bulkhead. Now pin the sides in place. Clamp the sides to F-1 bulkhead, epoxy and insert and glue in place the trailing edge stock firewall braces. Glue on the top back fuselage sheet and glue the fin into position. Glue on the top front fuselage piece and bevel the rear edge to match the contour of the wing cutout. Glue the hatch stop to the inside of the hatch at the front end.

When building the wing, decide whether you will build a flat wing or a wing with a minimum amount of dihedral. For all you doubting Thomases, a wing without any dihedral whatsoever glides just as well as a wing with a small amount of dihedral, and is a hell of a lot easier to build. The air foil of this wing is such that the wing can be built on a flat surface, and does not require a special jig such as a full symmetrical wing would require. Be sure to use a spruce leading edge and spruce bars as called out on the plans. This adds considerably to the overall weight of the wing. Also, before adding the top main spar, cut, and glue  $\frac{1}{16}$ " webbing in place in each bay for the full

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length of the wing. Although many of the prototypes did not include this feature, it does add considerable strength to the wing with very little weight addition.

When the wing is completely dry, remove from the building board and glue in the bottom secondary spar. Glue bellcrank mounts into position. Design your servo rails or servo platform, to fit the type of radio system you are going to use. When the wing is sanded to completion, cover the bottom of the wing first then add the bellcrank pivot screws and nuts. To prevent the heads of the screws from rotating inside the covered wing, cover the screw heads with glue before covering the top side of the wing.

From the mechanical standpoint, the trike geared prototype shown in the photographs used Top Flite landing gear brackets, and a cut down Jensen nose wheel tiller. The nose gear, itself, is a Jensen nose gear which allows you to make the right angle bend for the axle at any location you so desire. Any type of engine mounting plate may be used, and a Tatone steerable nose gear mount can be used to simplify the installation. Again, the prototype in the photographs used a set of Midwest T-Mounts. A Sullivan 4 ounce RST fuel tank was used, which is more than adequate for flight duration. Extra long Royal Products control horns with backing plates were used on the ailerons to cut down the amount of aileron throw. Be sure to install these horns on the ailerons **backwards**, which permit a proper amount of differential action. Standard control horns with backing plates are used on the rudder and elevator. This aircraft is perfectly capable of flying without ailerons, if sufficient dihedral is used. On the other hand, the rudder can be glued permanently in place and only the ailerons and elevator used, if you so desire.

It is not necessary to cover the fuselage at all unless you so desire. Again, referring to the prototype shown in the photographs, the fuselage was covered with red Super MonoKote. The wing, and empennage were covered with an experimental roll of the yellow transparent Super MonoKote. This provided a beautiful aircraft, with a superb finish which was both durable and lasting.

We do not hesitate to recommend this aircraft to you regardless of your flying proficiency. As a closing thought consider this: the original Ugly Stik was a miniature aircraft as it was not a model of anything in the air at that time. Would that then make the Liddle Stik a scale model of the Ugly Stik? If so, just think of what flying scale has come to.