Addendum 4

Das Ugly Stik - **Original Publication**

The GRID LEAKS magazine article compared to the Jensen kit

Many modelers had the kit of Das Ugly Stik made by Jim Jensen. That mainly determined the image that people had of the Stik. Though several modelers built the Stik after the original plan published 1966 in GRID LEAKS magazine, obviously far more noticed and appreciated the kit that was available for a long time, and the Jensen plans re-published 1985 with instructions.

This must be the cover of the Jensen kit. It shows the model in the most popular paint scheme being suggestive of a German WWI airplane. This goes back to Phil Kraft's published plans, but the fancy "decorations" - engine cowl, pilot and gun - are omitted. Maybe the second paint scheme following American WWII trainer airplanes is adequate to a trainer and sport model, but obviously it never became popular. Moreover, using an ancient-style font – aptly named Gothic – for the model's name on kit and plans, the first paint scheme became *the* livery of Das Ugly Stik.

Besides omitting the decorations, Jensen worked in the customary three degrees of dihedral. While Phil Kraft's original version without dihedral was easier to build, maybe Jensen felt the model looks better with dihedral. The "Fokker-type" wing planform may let the straight wing look as if it had some anhedral. Though several modelers still preferred the straight wing, the licensed kit versions all had dihedral (the Graupner Middle Stick, for instance).

But let's have a look at Phil Kraft's 1966 article to see his original intentions and appreciate his achievement.

Phil Kraft's original publication

The author-designer readies the ship for starting. The plane is a simplified version, as George Walker's model, right, indicates.

Das Ugly Stik

Something different in multi trainers with full pattern ability.

By PHIL KRAFT

THE ORIGINAL CONCEPT of the Ugly Stik was to design a radio controlled aircraft which could be built in an absolute minimum of time. Its purpose was towards a flying test bed for new proportional control developments and an all-around shop airplane which could be used as a loaner for visiting flyers, testing repaired equipment, and any use which required an airplane which could be considered as expendable.

In the original form, the Ugly Stik was completely square. All surfaces were merely cut out of standard sizes of wood with no curves or frills whatsoever. The plans were finished on a Sunday afternoon some two years ago. A visit to our local hobby shop was made at approximately 4:30 to purchase the wood and other necessary materials. Taking time out for Sunday din-, still the framework was completed by 10:00 o'clock that evening. Two more evenings were required for covering and doping, and on Thursday of that week, the ship was first flown.

Obviously not much time was taken in sanding or painting. This was to be an expendable, utility airplane. As with most straight-forward functional designs, the Ugly Stik proved to be an excellent flyer. It was extremely stable, very easy to fly, and quite capable of contest performance. I am not sure who first applied the name Ugly Stik to the design, but whoever it was certainly applied a descriptive name. Wherever it was flown, I was subjected to a great deal of kidding about finally having developed an airplane even uglier than the Kwik Fli. There were also a great many requests for plans, particularly among the newcomers to radio control who wished for an easy-to-fly, rugged, expendable airplane to learn on—which this surely is.

There was in this early square design something suggestive of a World War I type aircraft. As a joke with assorted scribbling on the plans, we came up with a design vaguely reminiscent of the Fokker-Eindecker. The results were perhaps no less ugly, but did tend to produce a design with a certain amount of charm and appeal. Certainly it never fails to create a great deal of attention among the spectators at the local flying field.

Performance-wise, it of course can not be classed as an all out competition Class III model. However, it is certainly capable of winning contests in the hands of a good flyer. While the design has not been used a great deal for contest work, it has several wins to its credit in Class III. Its main virtue is as a trainer for the beginner in proportional *(Continued on page 6)*

Phil executes fly-by for benefit of lensman. He built basic frame in less than five hours, covered and doped in two more evenings.

Das Ugly Stik

(Continued from page 5)

control. I have always felt that is a waste of time for newcomers in our hobby to spend over a hundred hours on an elaborate Class III design to learn on. Inevitably, unless the beginner is of remarkably unusual talent, he's going to have minor or major accidents due to misjudgment in learning. Therefore the Ugly Stick fits the requirements perfectly as a trainer. It is about as simple as possible to construct. As stated before, it is rugged and very easy to fly.

For those merely wishing an expendable trainer, the scalloped strip ailerons, elevator and rudder can be dispensed with, and just straight forward construction used. However, the details toward making an early type of German World War I airplane add only an hour or so to the building time and create quite a novel appearance.

Construction is so straight forward that very little in the way of detailed step by step instructions are required. The grade of wood used throughout is not particularly critical as the flying weight can vary from 5¼ to 6½ pounds without materially affecting performance. Actually the Ugly Stik flies best at about 6 pounds using .56 to .60 engines. This gives lively flying.

The fuselage is absolutely straight and flat on the bottom. The first step in construction should be to cut the 3/32" plywood bottom sheet as indicated on the plans. Pin this to a flat work surface, along with the 3/32" bottom planking which is spliced to the plywood nosepiece. The fuselage sides are cut from ¼" sheet balsa as well as the bulkheads with the exception of the ¼" plywood firewall. Cement the bulkheads to the bottom sheet and then merely position the fuselage sides against the bulkheads and the bottom sheet. The firewall should be secured with a liberal application of epoxi cement for strength.

The stabilizer, elevator, fin and rudder can be cut from soft ¼" balsa sheet, although it is preferable to use the built up construction shown. The elevator can be installed during fuselage construction, if your work surface is large enough to accommodate it flat against the bottom sheeting. The construction is so designed that the fuselage can be completed including servo mounts, stabilizer, and rudder all in one step.

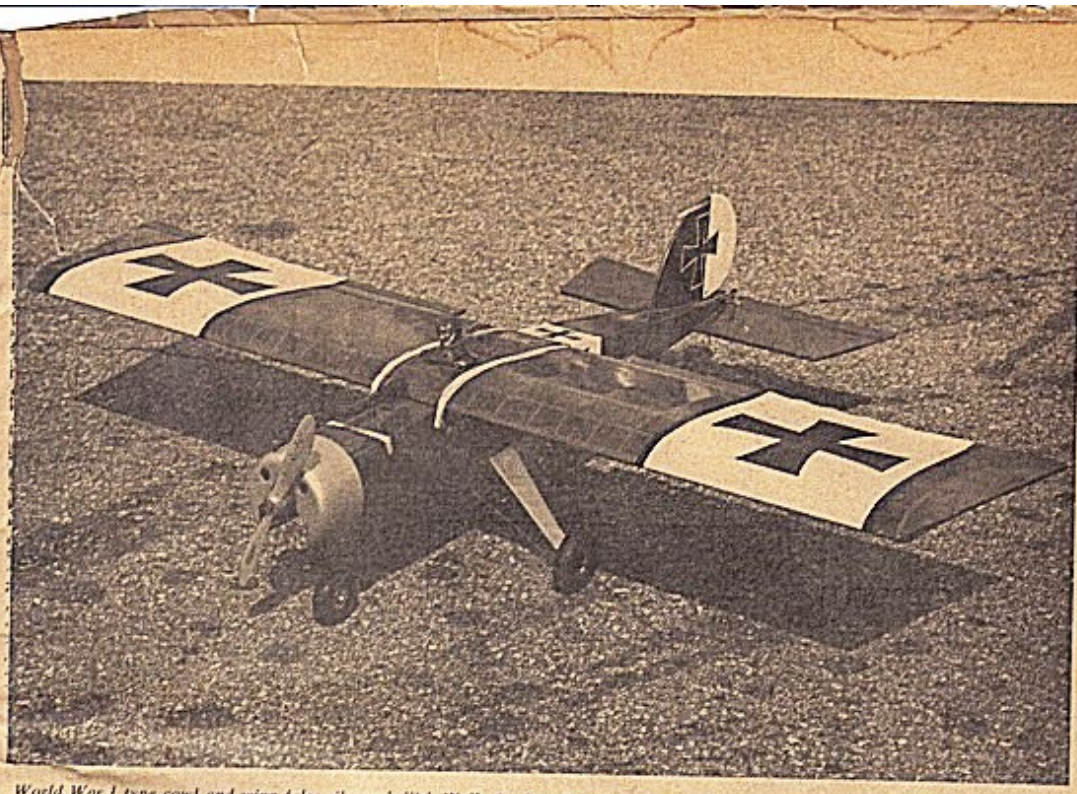
The wing has no dihedral, and the ribs are flat from the bottom spar to the rear. Therefore, no jig is required and the wing can be completed on any flat work surface. For maximum simplicity, the aileron linkage is external and holes are cut in the side of the fuselage to allow clearance for the servo as well as the piano wire pushrods to the aileron bellcranks.

On the original, only the wing was covered with silk. On the balance of the wood surface I merely utilized a good dope. The open frame construction of the wing has given no problem with warping, though we have seen some examples of other Ugly Stiks where apparently the builder propped it wrong while the dope was drying, resulting in some rather severe warps. Actually, removing warps from an open frame wing structure of this type is extremely easy. It only requires the use of heat while twisting against the warp to insure a flat wing surface.

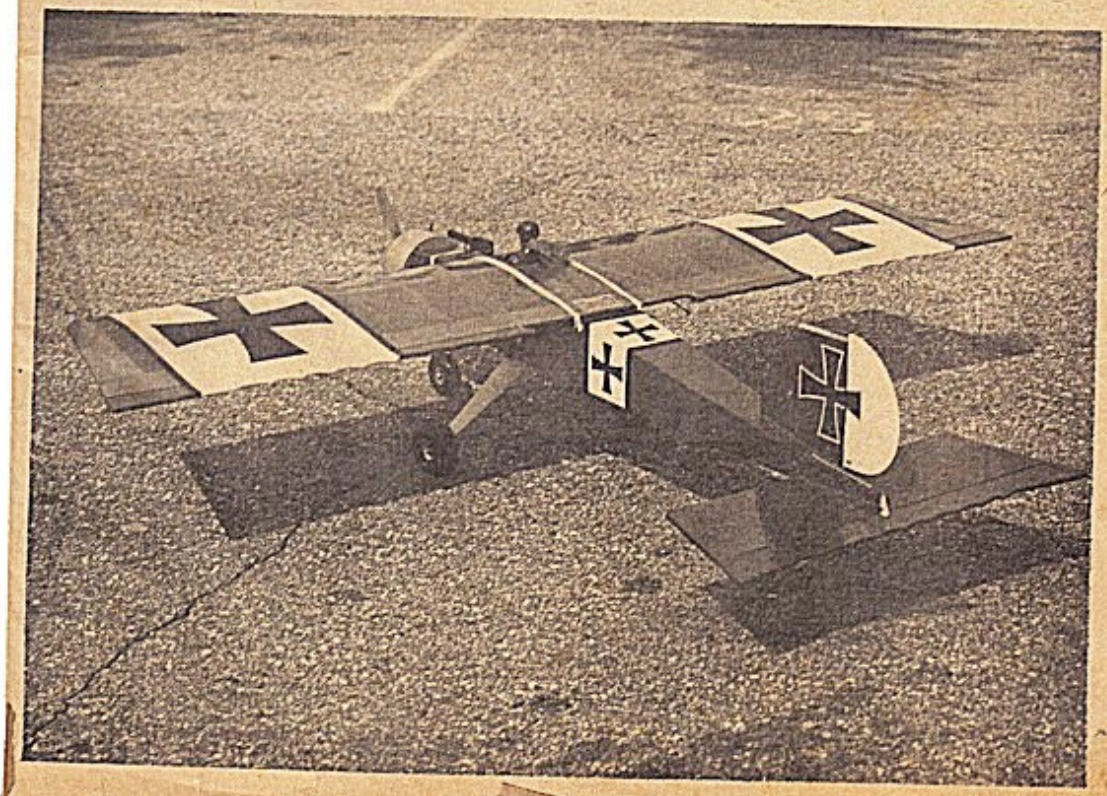
Flying of the Ugly Stik is equally as simple as the construction. The design is not overly critical to center of gravity location. It should balance approximately on the main spar or slightly to the rear. No thrust offsets are used.

To sum up, considering the minimum amount of time and effort put into construction, I doubt that we have ever had more fun flying a radio-controlled model aircraft. We believe it is an excellent choice for the beginner and an ideal trainer for multi proportional flying.

Hope you enjoy it!



World War I type cowl and wing false ribs embellish Walker's ship. Excellent kit available from producers of Phil's Kwik-Fli kit.



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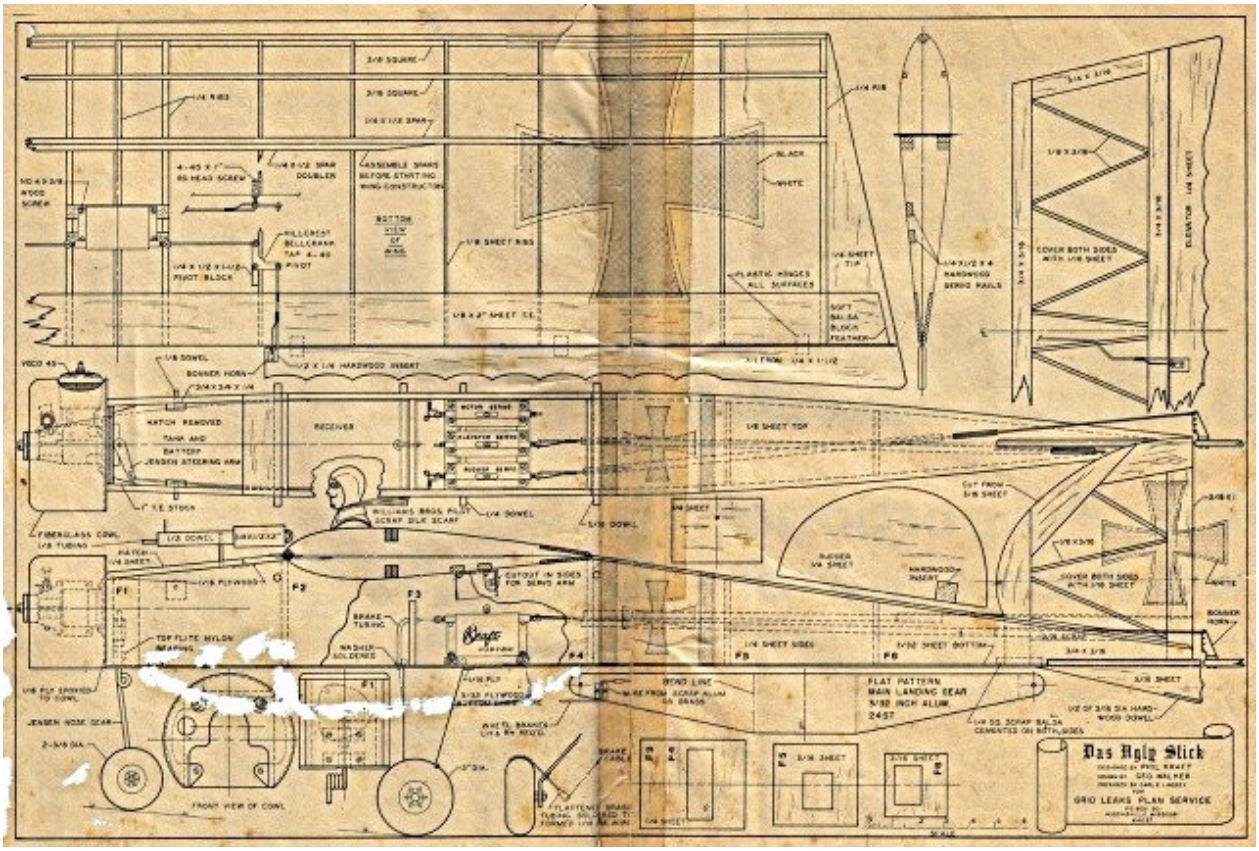
This is the original article, as provided by Eric Wildermuth. The creases of the magazine cover, the brown color of the other pages, and the traces of usage on the plan below give an impression of authenticity. I left these things as they are. I also refrained from typing the text and only showing the pictures. Otherwise you, dear reader, might think I'm telling tall stories after you read the text. Phil Kraft himself tells the story of Das Ugly Stik as if it were nothing unusual. But if you manage to read the text in the scanned images above (some enlargement may help), you – as I myself - might find some things unbelievable.

I was surprised how clever Phil Kraft really was. The straight wing with flat-bottom ribs and also the fuselage are designed for very quick build without a jig. Phil Kraft aimed at ultimate simplicity and just therefore got a good flying model. It's yet unbelievable how fast he made the plan and built the model. He was 40 years old then and must have been a very dynamic man. Despite his efficiency, he even cared about some decoration. It's amazing that he not only drew and built the cowling, pilot and gun, but also a moustache and a scarf for the pilot and the sight of the gun.

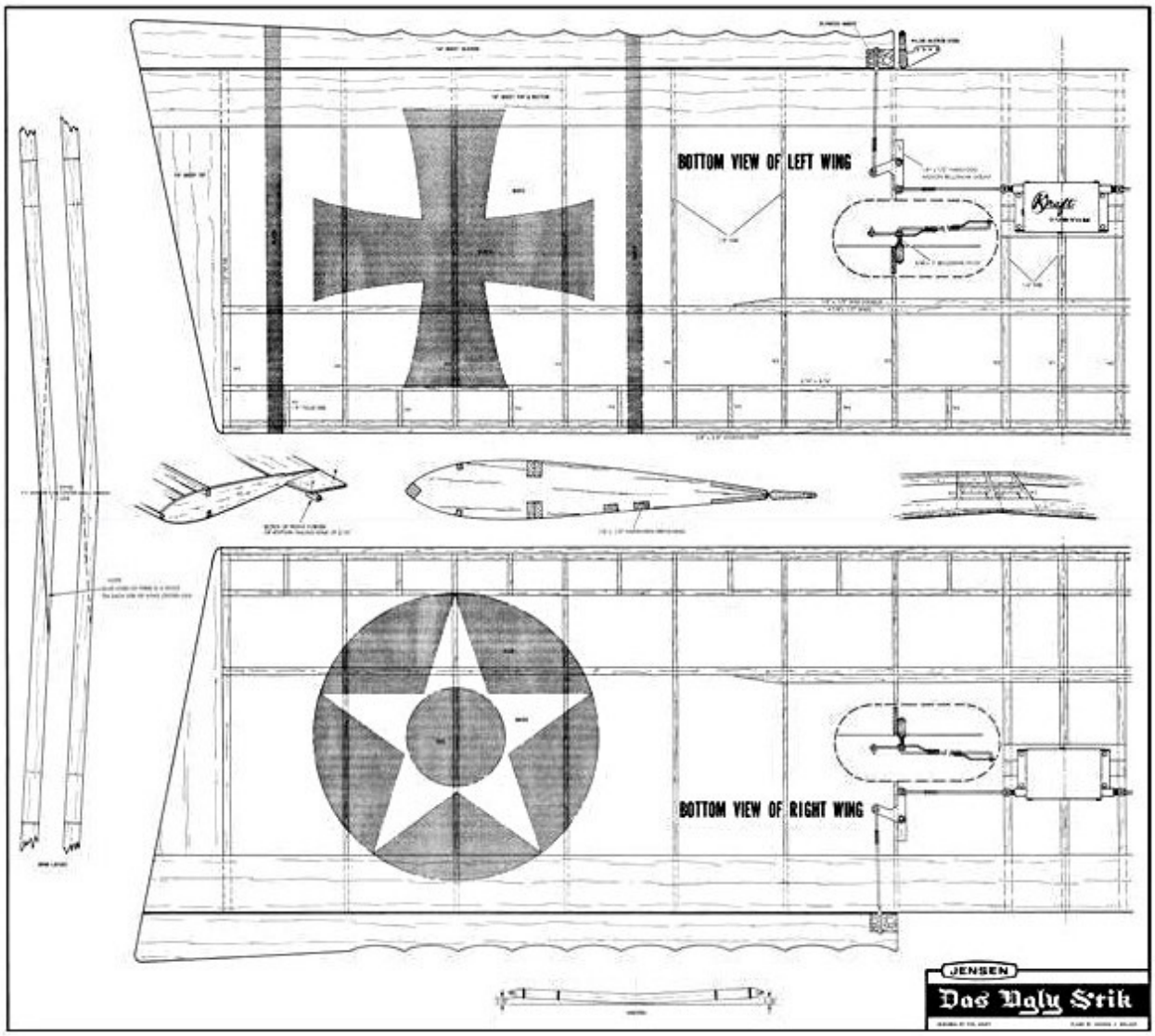


The plan published in 1966 GRID LEAKS magazine. Obviously, this one has been used.

There wasn't really much to improve. The differences of the Jensen version to the original are small and may be a matter of taste. Let's look at the details.

The Jensen version adopts the overall appearance of the model as well as the construction. The scalloped ailerons and elevator were retained as important for the WWI fighter look, the "German" paint scheme was emphasized.

The most important modification was adding dihedral to the wing. Likely this was done only to improve the looks of the model by avoiding the impression of anhedral ("lame" wings), but we don't know for sure.

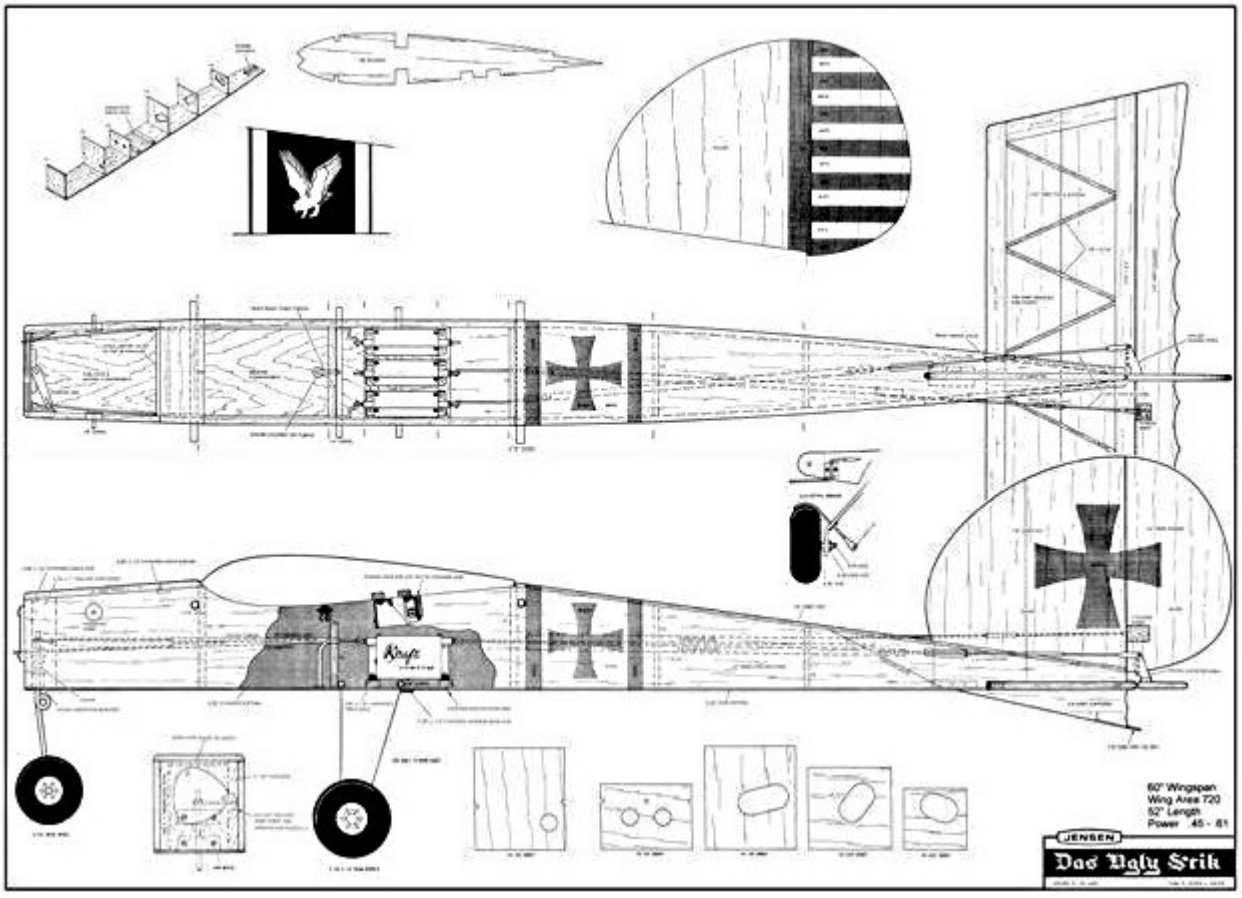


Wing sheet of the Jensen plan. The instructions on the left margin were cropped.

The pure "frills" were omitted, though, namely the pilot and gun. The engine cowl improved the looks of the model, but maybe it was regarded as not only unnecessary but also impeding access to the engine. Anyway, it was omitted as well.

The landing gear was left unchanged except that the hardwood tailskid tip was replaced by a piece of piano wire.

A more obvious modification refers to the bulkheads. In the original plan, there are rectangular cutouts. In the Jensen plan, there are oblique rounded cutouts and these are in different places. They are provided for rudder and elevator linkages.



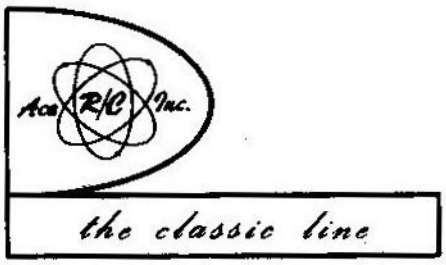
Fuselage sheet of the Jensen plan.

Actually, subtle modifications were done to the control linkages. While the elevator linkage is cranked and comes off the fuselage top in the original version, it is straight and comes off the fuselage side in the Jensen version. The aileron linkages have 60 degrees bellcranks instead of the original 90 degrees bellcranks.

Whereas the elevator linkage modification seems to be a mere mechanical simplification or improvement (greater stiffness), the bellcrank modification might match the wing dihedral. The latter gives some directional stability, the former some aileron differential eliminating adverse yaw. Both are at the cost of less roll rate and apply only to flying upright and not inverted, but that's just why this combination is very common for trainer models. By the way, even pattern competition models of the early 1960s had some dihedral and semi-symmetrical airfoils.

So perhaps the Jensen version could be meant as an even more easy-to-fly trainer than the original version, while Phil Kraft as a brilliant pilot considered this to be even extremely easy-to-fly.

Remembering the Origin



DAS UGLY STICK

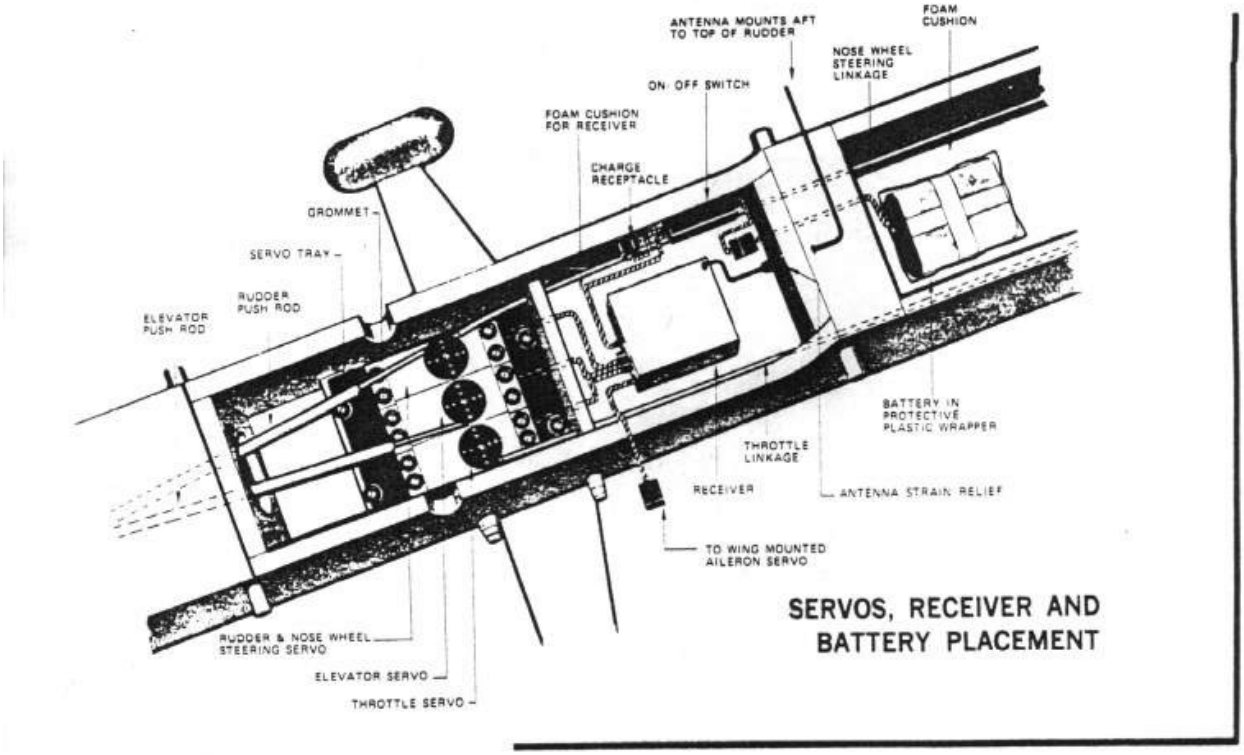
The Ugly Stik was originally the Square Stik. By adding scalloped ailerons and scalloped elevators, and adding a semi scale rudder, this .45 to .60 powered proportional testbed resembled a Fokker-Eindecker World War I plane.

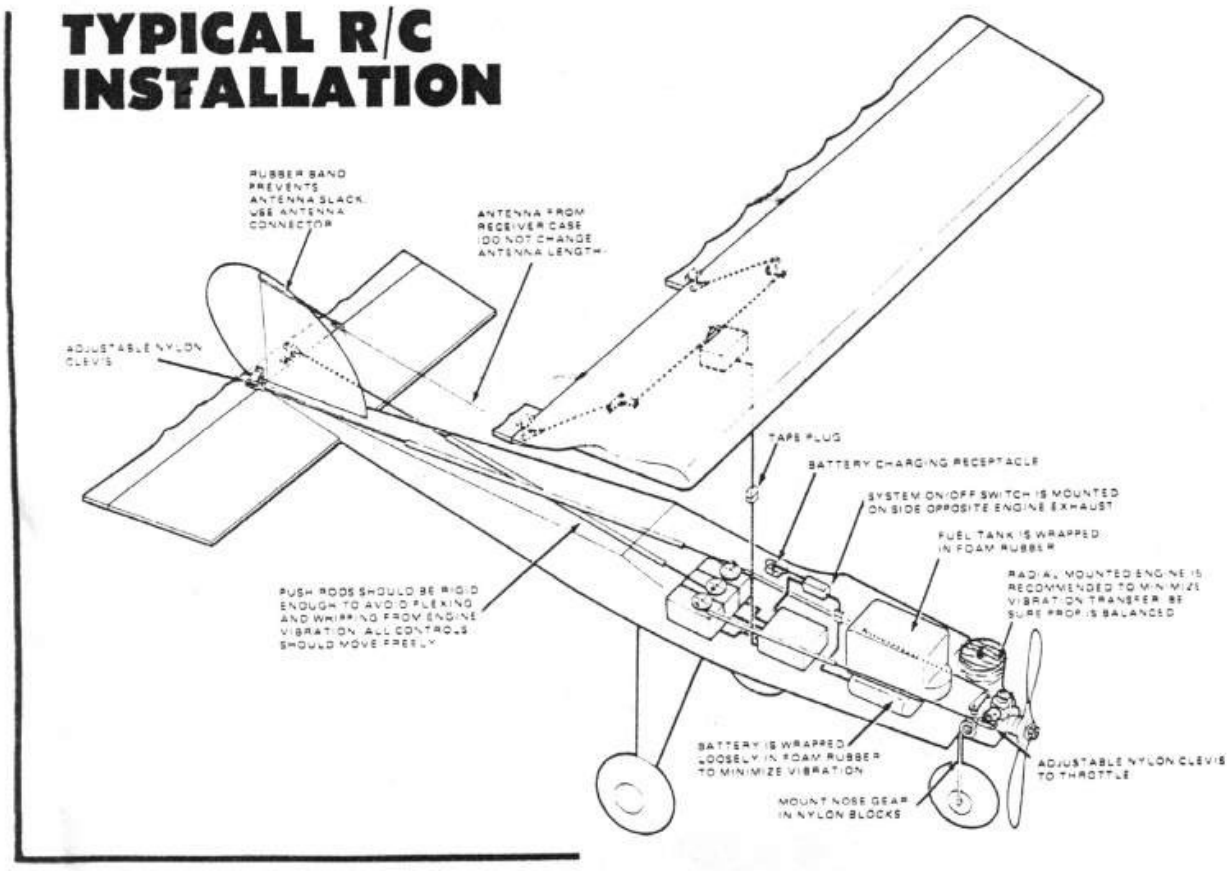
Used by Phil Kraft as a testbed for new proportional gear, this one has several Class III wins under its belt. If you are looking for a plane that is easy and fast to build for your proportional, this is your baby. You can use it in either the square configuration or in the semi scale configuration.

Eric Wildermuth not only had the original article and plan he used to build several Stiks, he also found an old Ace R/C ad remembering the derivation of the Ugly Stik from a Square Stik, as Phil Kraft told in his article.

Bits and Pieces

The following drawing shows the typical R/C installation in the Ugly Stik. It is from a time when the servos already had rotary actuators and the Ugly Stik was very popular. Just an interesting aside...


ANTENNA MOUNTS AFT TO TOP OF RUDDER
FOAM CUSHION
NOSE WHEEL STEERING LINKAGE
ON/OFF SWITCH
FOAM CUSHION FOR RECEIVER
CHARGE RECEPTACLE
GROMMET
SERVO TRAY
RUDDER PUSH ROD
ELEVATOR PUSH ROD
BATTERY IN PROTECTIVE PLASTIC WRAPPER
THROTTLE LINKAGE
RECEIVER
ANTENNA STRAIN RELIEF
TO WING MOUNTED AILERON SERVO
RUDDER & NOSE WHEEL STEERING SERVO
ELEVATOR SERVO
THROTTLE SERVO
SERVOS, RECEIVER AND BATTERY PLACEMENT


TYPICAL R/C INSTALLATION
RUBBER BAND PREVENTS ANTENNA BLACK USE ANTENNA CONNECTOR
ANTENNA FROM RECEIVER CASE DO NOT CHANGE ANTENNA LENGTH
ADJUSTABLE NYLON CLEVIS
TAPE PLUG
BATTERY CHARGING RECEPTACLE
SYSTEM ON/OFF SWITCH IS MOUNTED ON SIDE OPPOSITE ENGINE EXHAUST
FUEL TANK IS WRAPPED IN FOAM RUBBER
RADIAL MOUNTED ENGINE IS RECOMMENDED TO MINIMIZE VIBRATION TRANSFER BE SURE PROP IS BALANCED
PUSH RODS SHOULD BE RIGID ENOUGH TO AVOID FLEXING AND WHIPPING FROM ENGINE VIBRATION. ALL CONTROLS SHOULD MOVE FREELY
BATTERY IS WRAPPED LOOSELY IN FOAM RUBBER TO MINIMIZE VIBRATION
ADJUSTABLE NYLON CLEVIS TO THROTTLE
MOUNT NOSE GEAR IN NYLON BLOCKS

Sources

Eric D. Wildermuth from Brisbane, Australia, kindly provided the scanned images of his copy of the Grid Leaks magazine and valuable information from his rich experience building and flying several Ugly Stiks. Later he even found the advertisement mentioning Ugly Stik's derivation from a "Square" Stik. Thank you very much!

Some members of the Vintage R/C Society scanned all old Grid Leaks issues and put them on the Web. Look here for volume 7 number 3 to find the Ugly Stik article with plan. It was also shown without plan in an Ugly Stik thread on RC Universe.

The Jensen kit's cover and plans are borrowed from "Uncle Willie's" website (half way down). The building instructions on the left margin of the wing plan are lost.

The R/C installation plan was shown in a thread on RC Groups.