



NARTS Plan SP-104

the DISASTER 17-B VALKYRIE

designed by **BRUCE BLACKISTONE** 6413

CANARD

cánard' (or *ká nár'*), n. [Fr. a duck, a false newspaper report.] 1. A hoax; especially, an untruthful report in a newspaper or other medium, for the purpose of deceiving the public. 2. A type of airplane having the controlling surfaces in front of the main plane and the propeller behind them. (Webster's Unabridged)

The original Disaster 17-B Valkyrie was constructed around January, 1968, and destroyed, late that same year, by a dog who craved engine residue.

Canard boost gliders had been built before, notably by the elder Mr. Guill, one of whose I had seen fly the year before at NARAM-9 in Mankato, Minnesota, but these were rear engine gliders, and none had been built to take advantage of the increasingly common front engine/drop pod configuration.

At the second Pittsburgh Spring Convention that year, I asked G. Harry Stine about a Polish front engine canard I had seen in a photograph. He said it was a fairly simple variety, with fixed pod and fixed canards.

Thus I felt I had come up with something unique, having merely plagiarized the general platform of the USAF's XB-70 Valkyrie high altitude bomber.

The first flight revealed the glider's best feature, its incredible strength. It pranged twice at ECRM-II from two-hundred or so feet due to pod ejection failures. (The original was quite prone to this, the elevon being controlled by enough string and rigging to panic a clipper ship captain.) The original managed to set the first U.S. Metric-engine Boost/Glide record at NARAM-10 before its eventual canine destruction, and other versions have flown with various degrees of success and in different sizes, from one-half size to double size "dragon class" versions.* (These, of course, are noted for showering the earth with balsa fragments.)

CONSTRUCTION

The literal backbone of the Valkyrie is the inverted "T" beam used as the main boom. Make sure that the stock of 1/4" x 1/8" balsa is

straight, and take extra care when gluing to be sure alignment is straight, for if it is, it will be next to impossible to misalign the wings. Be sure the corners do not bunch up with glue.

The wings are usually made in two pieces, due to the standard 3" width of balsa. Cut out the separate pieces and glue together at the joint on wax paper, weighted on a flat surface.

The fixed portion of the canard is also set up this way to keep the grain parallel to the leading edge. Make sure its trailing edge is set straight and square when the two halves are joined, then, like the wing, put it on a flat surface with waxed paper under it, apply glue to the edges, put waxed paper over it, and weigh down with about half a dozen school books.

While all this is drying, go ahead and cut out the canard flap, vertical stabilizers, and pieces for the pod. Sand only the trailing edge of the canard flap, leaving the leading edge free. Sand the rest in a standard airfoil, paying attention to which is the root and which is the leading edge.

The pod is a little different from most, having the coupling equipment set on the outside to preserve the structural integrity of the boom. (If you're fussy, go ahead and round part B and sharpen part A and fool around with it, maybe try plywood, experiment.) The bottom rib is the one part that *must* be perfectly aligned. Be sure that once again glue does not accumulate in the corners to affect the fit.

After attaching the bottom rib, launch lug, and engine hook, it's time to mate the pod to the boom. Attach parts B to the boom so that they square up against the cross piece and glue, being more liberal on the corners of the leading edge. Once this has dried, slip the bottom rib betwixt the two part B's, which should just touch the bottom of the pod, and draw a line for mounting the forward edge of each piece A on the bottom rib. When the part A's are attached, the side extensions should have their bottoms level with the top of the T-beam cross piece.

The wings (which should be dry by now) should now be sanded to reflex airfoils, with the leading edges rounded from the upper side and the trailing edges sharpened from the underside. Once the wings have been airfoiled,

cut off the last 1 3/4" of the wingtips and hold for future use. Sand the root edges at the appropriate angle and glue to the end of the boom, elevating the tips from 3/4" to 1". Be sure the glue joint is extra strong and filleted top and bottom. When the wings have dried, sand the tips at an appropriate angle and attach them for the downturned wingtips.

Round the leading edge of the main canard, and glue it in its proper position along the bottom of the boom. The canard flap may then be attached with a paper hinge. On the upper side the canard activators are made of light maple dowels. Measure them carefully and make sure that they are glued only to the canard flap and not the main canard or the boom.

Measure out the positions for the outboard fins on the main wings, being sure to get them parallel with the boom. (A piece of 3" balsa stock does this rather nicely: lay it along the boom, draw the line and place the outer edge of the fin inside the line.) Sand the fin on the proper angle and glue on, being sure it doesn't droop or sag to one side while drying.

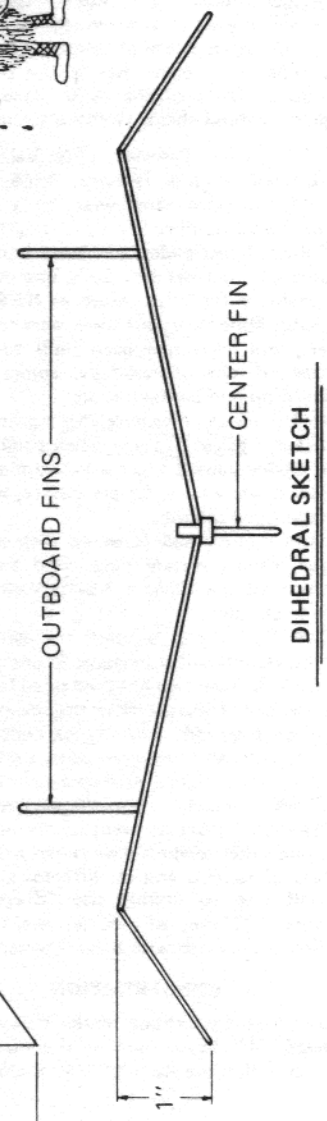
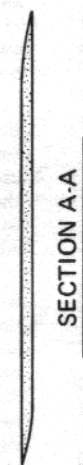
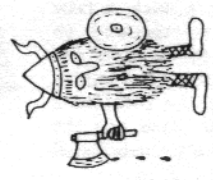
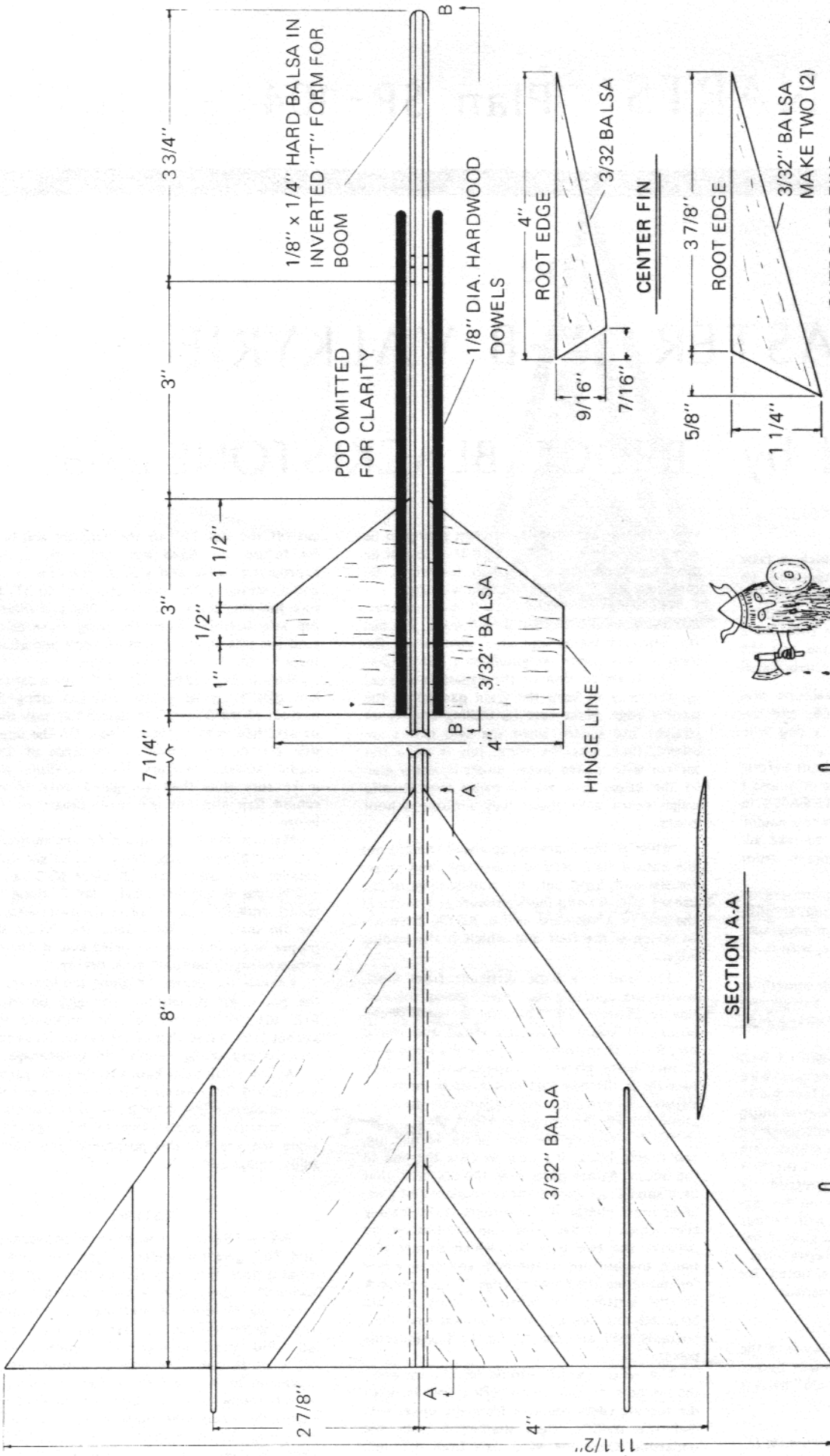
Eyeball the center fin along the bottom of the boom for straightness and glue on. Note that the trailing edge of the outboard fins sweeps back while that of the center fin sweeps forward, protecting it from landing breakage.

Attach small balsa hooks to the main canard and canard flap, attach elastic to these and run the adjustment pin in its position in the boom (or, through a small piece of balsa attached along the top for this purpose if you like to adjust things a lot).

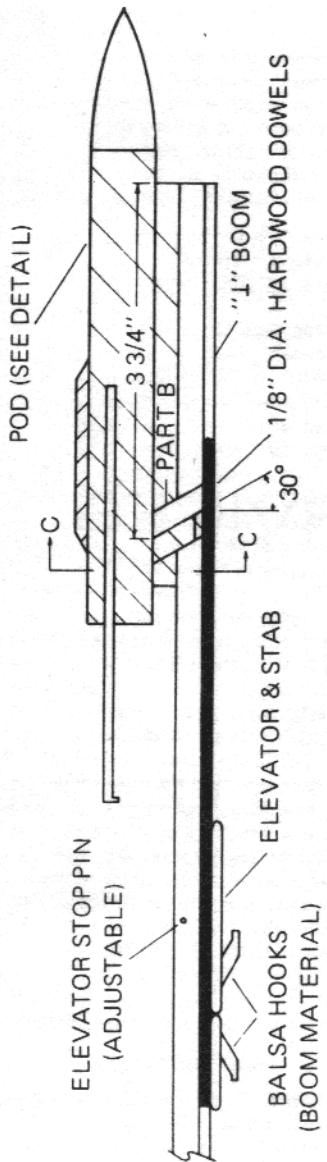
TESTING

Adjust the canard somewhere between 30° and 10°, give the glider a light toss, and see what it does. If it stalls, flatten the canard angle some; if it dives, give it more canard. Once it seems to be doing something that resembles flight, grasp it firmly by the tail, run to build up wind speed, and give it a mighty heave, wringing it out. One way or another you're bound to be surprised. No matter what happens at this moment, start planning your next one, especially when you consider what it will do once you put an engine in it. Now you too can show the competition the joys of Valhalla!

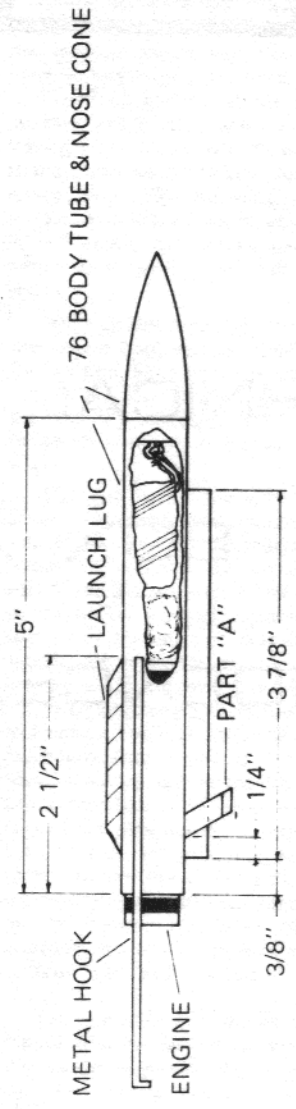
*Wingspan minimum 22", power minimum D



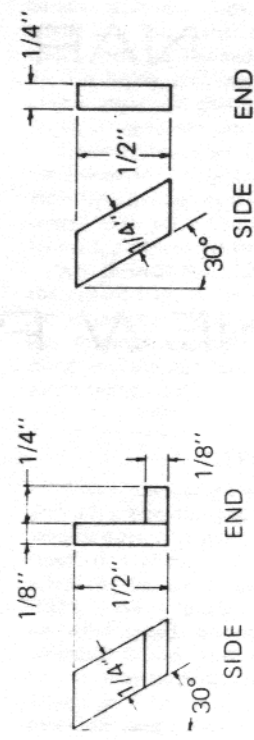
DISASTER 17-B VALKYRIE
 DESIGNED BY BRUCE BLACKSTONE
 DRAWN BY PAUL C. CONNER II



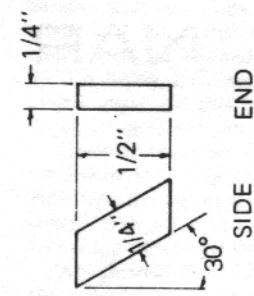
SECTION B-B BOOST CONFIGURATION



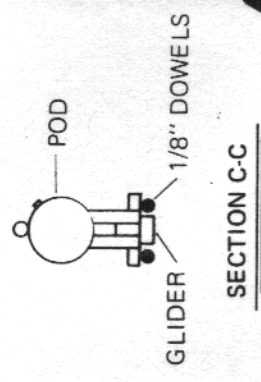
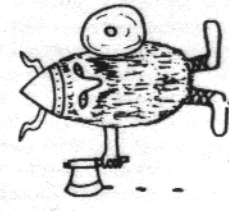
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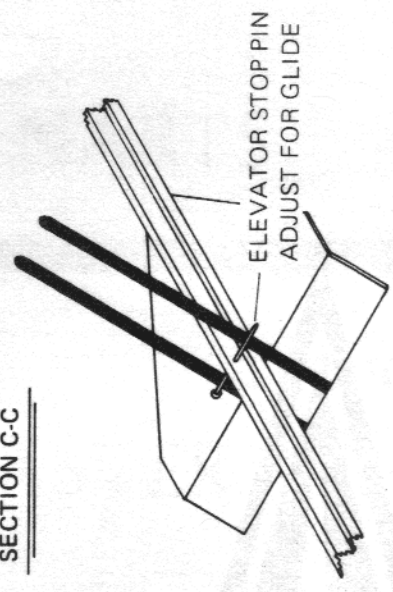
PART \"A\"



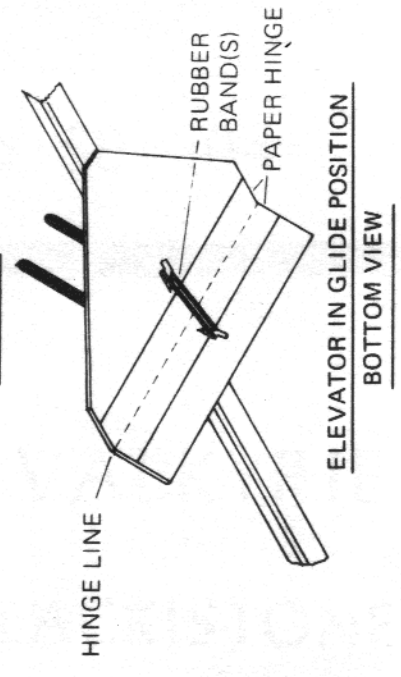
PART \"B\"



SECTION C-C



ELEVATOR IN GLIDE POSITION
TOP VIEW



ELEVATOR IN GLIDE POSITION
BOTTOM VIEW

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