

The business end of Steve Whitman's open-spinnered, 1937-38 Bonzo. The boxy but clean and simple lines were his trademark.

STEVE
WHITMAN'S

BONZO

by
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● The imaginative home-built aircraft flown during the Golden Age of Air Racing by the most skilled and daring pilots of the day will always be my special favorites. Many combinations of airplane and engine were tried to gain the biggest prize of all, the Thompson Trophy. The Trophy was presented to the winner of a closed course pylon race for aircraft of unlimited specifications. By the late '30's, the race had evolved into a 20 lap grind around a 15 mile course.

About 1934, Steve Wittman, who had already achieved considerable success designing and racing smaller aircraft, decided to go after the Trophy. His

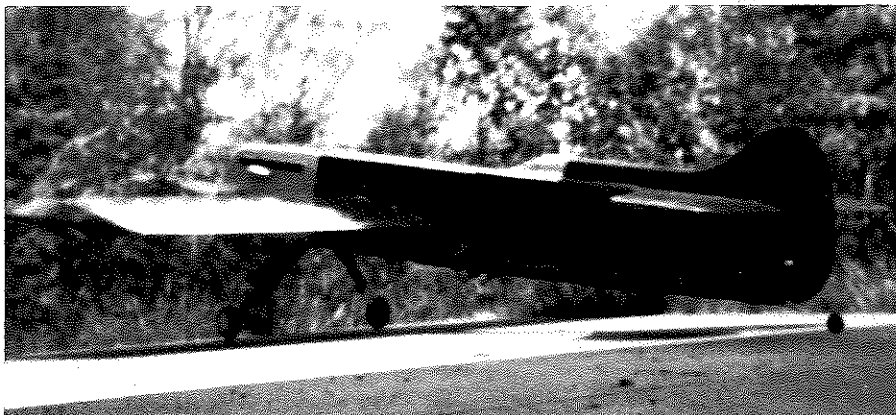
approach was to wrap an extremely simple box-like airplane around a 1145 cu. in. Curtiss D-12 engine. The result was Bonzo, often referred to as the Flying Barn Door. Bonzo began life with a conical spinner and rectangular radiator mounted external to the cowling. A multi-strutted landing gear was attached to the fuselage and engine mount. By 1937, the patented Wittman single leaf spring landing gear was installed and a new radiator was fitted around the propeller shaft behind a flow-through spinner containing fan blades. This spinner-radiator combination was the most successful cooling arrangement used on Bonzo, but the

rather flimsy open-nosed spinner continually gave cause for concern. So in 1939, the spinner was removed completely and the formerly unpainted aluminum cowling and upper deck was painted red to match the rest of the airplane. This is the version which is on display at the EAA Museum at Hales Corners, Wisconsin.

Primarily because of cooling problems, Bonzo never won the big race, but was the fastest qualifier in 1937 with a speed of 259.11 mph. Bonzo finished 2nd in 1935, 5th in 1937, 3rd in 1938, and 5th in 1939. Excellent 3-view drawings of the real Bonzo by William Kerka can be obtained from American Air Racing Society, P.O. Box 121, So. Euclid, Ohio 44121 for \$2.00.

The model racer presented here most closely resembles the 1937-38 open-spinnered version of Bonzo. It was designed primarily as a Formula II and F.A.I. pylon racer, but the 15 percent thick, 610 sq. in. wing permits it to be raced as a .60 powered sport-pylon ship as well. I have not as yet tried the latter, but I expect it would be a real threat.

To maintain the scale appearance of the low-aspect ratio, long fuselaged Bonzo, the wing was made as short as the rules allow, namely 50 in. With an area of 610 sq. in. required, the aspect ratio turns out to be about 4 which compares well with the real Bonzo's 3. The



This view accentuates the extremely simple lines of the Bonzo. Ship is exceptionally stable, even at the slow speed required for no-bounce, 3-point landings.

fuselage was then made as long as I thought weight and drag would permit. This also helps to make the wing appear shorter than it really is. Fuselage height and width were tailored to meet the model racing rules.

Last summer, Bonzo was 3rd in both the Chardon 500 and the Mentor Firecracker 500 Formula II races and 4th in the Wright Brothers Memorial F.A.I. event. Incidentally, the model has not had cooling problems.

FUSELAGE CONSTRUCTION

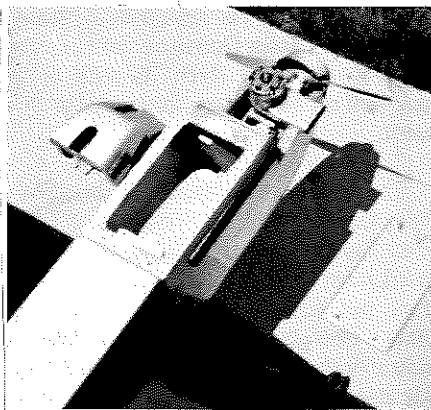
The fuselage is a rather conventional plywood and balsa box structure. However, dummy stringers are glued to the sides and bottom of the box to give the appearance of real stringers and longerons when the structure is covered. The fuselage is begun by splicing the 3/32 inch plywood forward fuselage sides to the 3/32 inch balsa aft fuselage sides. If 3 inch wide balsa is used, longitudinal splices will have to be made in several of the balsa parts. The fuselage sides are then joined, upside down, using the 1/4 inch balsa top, the 1/4 inch ply firewall (laminated from two pieces of 1/8) and the 3 plywood bulkheads to square up the construction. If a Tatone engine mount is to be used, the front bulkhead should be tilted back about a degree so as to align the thrust line with the fuselage centerline.

The original model has longitudinal maple servo rails running the full length of the radio compartment, which makes the fuselage very rigid and crash resistant. KPS-9 servos are mounted across the rails.

The aft balsa bulkheads are then inserted and the fuselage sides joined at the rear. Install the elevator and rudder push rods before attaching the aft fuselage top and bottom. Balsa blocks and 1/8 inch sheet are used to shape the fuselage in the tank area.

In all of the fuselage, liberal use is made of triangular stock corner bracing. This is not shown on the drawings since it was felt that the extra dashed lines would obscure the basic structural members.

A large chunk of pine, cut from a 2 x 4, is installed in the aft end of the tank compartment for the landing gear mount. A 1/8 inch plywood plate is attached to the pine with flat head machine screws and blind nuts. The heads of the screws are countersunk into the plywood. The hardened aluminum landing gear is attached to the 1/8 inch plywood with round head machine screws and blind nuts. When the landing gear meets with a strong fore or aft resistance, the shock will pull the plywood



Cowl and hatch removed, it is possible to see the air ducting to the rear-rotary carburetor.

plate over the countersunk flat heads of the machine screws without overloading the fuselage structure. With a spare plate in your field box, the ship can be ready to go again in about 5 minutes.

The horizontal stabilizer and vertical fin are now built and attached to the fuselage. With these in place, the head rest and canopy are installed on the aft upper fuselage. The covering material is used to fair the headrest into the fin just like in the real Bonzo. The upper wing saddle and the dummy side stringers can now be added. Note that these are rather wide near the cockpit area so that the fuselage cross-sectional requirements of 3-1/2 by 7 inches can be met. Save the bottom fuselage stringers until the wing is built and installed so that the stringers can be faired into those under the wing.

ENGINE INSTALLATION

The original model uses a K&B 40 racing engine on a Tatone rear mount which already had a large hole for carburetor air. A K&B exhaust extension or a Silenceaire flow-through muffler is used. Carburetor air comes on board through an air scoop on the left side of the fuselage and is carried through plywood ducting to a hole in the firewall behind the carburetor. A 10 oz. Sullivan tank gives a comfortable reserve when racing with hi-nitro fuels. A much smaller tank, probably 6 oz., could be used for F.A.I. racing. The tank was pressurized from a fitting in the upper left hand corner of the engine backplate. The tank compartment lid is attached with four 4-40 screws and blind nuts.

The removable engine cowling is restrained with two 1/8 inch dowel pins fastened with a single 4-40 screw and blind nut at the upper rear. A standard glo-plug clip is inserted through the cooling air outlet for starting.

A 9x8-1/2 Top-Flite Pylon prop clipped to 8-5/8 diameter was used for Formula II racing. An 8-3/8 diameter

was necessary for F.A.I. fuels since a high compression head was not available to me. For F.A.I. racing, I would highly recommend a high compression head (if you can get one) and a larger diameter propeller.

A 2-1/2 inch diameter plastic spinner is adapted by epoxying the threaded nose in place and then cutting most of it away so that an electric starter can fit within the spinner. For slightly more speed in F.A.I. racing, where realistic appearance is not very important, a full spinner could be substituted. I suppose one could defend this arrangement since the first flights of the real Bonzo were made with a full conical spinner.

COVERING AND FINISHING

The cowl and upper deck to the rear of the canopy are sealed and painted with silver dope. The landing gear was sprayed with competition orange enamel until it matched the color of Missile Red Super Monokote. These parts, as well as the inside of the cowl and tank compartment are then given a coat of clear Hobbyoxy to make them nitro-proof.

The rest of the ship is covered with Missile Red Super Monokote. Note that the Monokote defines the external lines of the fuselage in many places. Except for underneath the stab, the fuselage structure provides surfaces to attach the edges of the Monokote. Under the stab, a thin wedge shaped strip of balsa can be added to provide a surface for attachment of the covering material. Black Regular Monokote was used for all trim and lettering.

FLYING

With the center of gravity no farther aft than shown, and with the control surface movements limited to those shown, Bonzo is a relatively easy racer to take-off, fly, and land. For take-off, the elevator trim is set in neutral and full up elevator is held so that the tail-wheel can act as an effective steering device. Up elevator is relaxed immediately after the plane leaves the ground. The race is also flown with the neutral elevator trim. For landing, the engine is shut off and except on extremely windy days, the elevator trim can be moved to about full up. This makes control of the airspeed during the dead-stick approach much easier than if back pressure is held on the stick. Back pressure is applied only during the flare to the three point landing and the landing itself. The airplane must be landed very slowly, in a full stall, to prevent bouncing. The major difficulty in doing this is to convince oneself that a six pound, high speed airplane can be flown as slowly as Bonzo can. Happy pylon polishing! ●