



CONSTRUCTION DETAILS:

BUILDING AND FLYING INSTRUCTIONS:

This Semi-Scale Grumman "AF-2S Guardian" is a Navy Carrier Fighter-Bomber. It is ideal for Control Line Flying, and is capable of flying the full stunt program. Designed by Bob Elliot, 1953 Show Champ, the model is easy to build, light in weight, yet extremely rugged. The wing area is slightly reduced from the real ship in the interest of good starting proportions. Full size plans are included, with numerous construction details, angle measurements and cross-sections. This will help you exactly locate dis-cut parts etc. as you progress.

Actual construction is begun with the wing. Mark off the 1" wide trailing edge strips with a pencil line 1/16" from the edge, to act as a guide when bending. Refer to the wing plan view and the cross-sectional view of the trailing edge as seen on the side plan view of the fuselage. The trailing operation is best done with a sharp angle cutter or a hand knife. A little correction of this plan will be required by a flexible and wavy line trailing edge.

Temporarily pin the lower trailing edge strip to the wing plan, and carefully cement each wing rib (or rear section of rib) in place. Allow to dry, check for alignment carefully from time to time. Now remove it from the plan, and pin the lower 2 1/2" x 1 1/2" x 3/8" in place on the plan. Bend or curve the piece with the plan. Apply cement to the notch in the rib, and cement to the spar. Bend up the trailing edge at this time to guard against misalignment. Allow to dry well, before attempting to remove from the plan. The 3/16" x 1/8" upper spar is installed next, followed by the 1/16" x 1/8" x 3/8" spar across the center wing section. The plywood wing spar is now carefully and thoroughly cemented in place, and allowed to dry. (Show ballcock cutout is slightly off-center. 3/16" measurement of remaining ply should be on the center of wing). The wing plan should be removed from the plan at this time.

The opposite or right hand wing panel is constructed in the same manner as the reverse blank side of this plan. The best surface will show through sufficiently, and if you wish, key points can be marked off more clearly in pencil, by holding the plan against a window for a minute or so. Construct it in the same manner as the left panel, joining to the left panel as you progress.

The landing gear formed wire is installed next. This has usually it is held in place with the spade bolts provided. Rectangular plywood reinforcements are included, visible in the wing plan view. The 1/8" die-cut sheet is now installed, followed by the 1/16" x 1/8" x 3/8" leading edge. All this point, the ballcock should be mounted as detailed on the plan. Form ribs of left panel only to mirror the lead-out wires. A pencil or compass point etc. will do the job. Use angle cement on the mount, and ballcock provided. The wire may then be checked along the leading edge, and shown at the center section. (Top and bottom corners of wing). Add wing tip block, a wood off and sand entire wing smooth.

The stabilizer is next to the tip. The leading edge and rear spar are marked. The 1/16" sheet ribs are shown, and the 1/16" die-cut ribs are cut out from the wood provided. The tail center sheeting is cut to shape. The stick should be laid out on plan, and aligned by eye as you progress. As for the elevator, they are tapered in cross-section and cemented to the cross-bar as detailed above. Ball elevator horn in place. Pick up tape is provided for large cement. The ballcock is now in place, and may be cemented in place. The stick is cemented, simplifying the operation.

The fuselage construction method used here is simple, and will do all the best results. The construction shown is for this type fuselage. It is designed in such a manner that it will align the motor and stabilizer in their correct locations and appear smooth and aerodynamic. A little care to all that you need for a perfect job. The details show above the fuselage in five stages of construction. Study them for a moment.

First remove the step cut with the corner of the file, from the 1/8" die-cut sheet. On a separate sheet, you will find the rear section of the step cut, together with three other key units shown in the first stage of fuselage construction above. Cement each in place as detailed. The wing is now carefully slipped into the corner, turning corner slightly if necessary. (Keep some incidence setting). Apply cement and align very carefully from top and bottom.

On another die-cut sheet, you will find a rectangular part with a long cutout for the motor mount. There are two such sheets provided, as remove both of these parts, and cement in place on each side of the step cut fuselage of the fuselage. The ends are slightly tapered to allow for wing span. See second detail. The plywood tail sheet is now in place, and may be cemented. Allow time for the cement to set. Cement the tail sheet in place. Cement the fuselage reinforcement for the elevator gear if you wish to install one. Cement assembled unit in place.

Our first step is the location of formers. The firewall is 1/8" ply, F-1 which locks up the firewall is 1/8" ply, and all others are 1/16" in thickness. Cement F-1, F-2, F-3 and F-4 formers in place. Each of these formers are in two pieces, one on each side of the vertical sheet fuselage step cut. The remaining cross-sections are constructed with four former parts. The upper quarters of F-2 are distinguishable by the mount corners. Cement in position. Lower quarters of F-2 and quarters of F-3 differ from others in that the vertical edge is free of any notches. Check against cross-sections, and cement F-4, F-5 and F-6 formers will position themselves, and if in doubt, check against cross-sections on plan. Next a slight ribcage has been built on the former edges joining the wing. Trim this off as necessary, as individual structures may vary slightly at this point. Slight along cross-sections and trim off slight irregularities as they occur. Install motor mounts. Frames formers as necessary for pulsed construction. Right side of F-2 and left side of F-3. The 1/8" x 3/8" x 3/8" spars are now installed. Bend and cement each side of the ballcock mounting of wing. Install forward ply wood ballcock spars etc.

You are now ready to plank the fuselage. Begin with the motor mount, that the ballcock mounting of wing. To locate correct position, which the motor to the center line, and wire back and forth until elevator movement up and down is repeated. Plank as much as possible before mounting the stick for working convenience. Planking is cut to various widths for your convenience. All planking is 5/32" x 3/8". Select minimum width and length required for each piece. Plank from the vertical and horizontal centerlines. See fourth fuselage construction detail. When these planking strips are cemented, carefully level the edges, tangent to the former edges. Proceed with care, using a sharp razor and file on a small block. Test the planking strips as you progress. Cement in place and allow to dry well before attempting to trim and sand body to final construction. Add tail block.

The rudder construction is self-explanatory, and needs little comment. The ribs and lead sheeting are drawn from 1/16" sheet stock. It may be assembled directly on the body if you wish. Offset the rudder slightly to the right to hold the model tight on the lines. The structure is now given a final sanding and made ready for finishing. Trace or silk coat the wing, ribs and rudder. Use wood filler on exposed leads. Clear dope areas replace with half-pint dope before color dope. Add details, wheels, gear formers and other accessories.

Select a calm day for test flying. Use about 20' lines for test flying at least. Determine the wind direction and position the model so that it takes off down wind, thereby allowing the model to become airborne before it is buffeted by the crosswind. Impaired flight should keep them close enough when testing, to avoid uncontrolled spin with great care. Having the rudder set will produce slight up elevator, lowering the cam, down elevator. It is to get the feel of the air, set your own accordingly. Start with care if you are a beginner, and practice maneuvers with the wind at your back. It will help you back with your "Guardian". It is a performer you will be proud of. It will look you up when it most at that constant coming out.

SEMI-SCALE STUNT FOR STUNT EVENTS AND NAVY CARRIER
GRUMMAN AF-2S GUARDIAN
 DESIGNED BY: BOB ELLIOT
 DRAWN BY: DON MCGOVERN
 KIT ENGINEERED BY: BILL EFFINGER
 COPYRIGHT 1954 - REPRODUCTION FOR RESALE FORBIDDEN. WINGSPAN - 32"

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