

# THE FLYING AIR WARDEN

**A high performance contest "C" gas model that looks like a real airplane**  
by **AL PARDOCCHI**

## FOREWORD

Al Pardocchi has produced some of the finest and most consistent planes ever built. Therefore, when he told us he had completed a new ship we expected to see an outstanding job, we were not disappointed. The Air Warden is not only pleasing to the eye but sensational in flight. Despite the fact that the motor did not deliver maximum power by any means, the ship turned in four consecutive 6 minute flights on 12 second motor runs. They were *not* thermal flights . . . . the Air Warden simply attained such altitude in those 12 seconds, and the glide was of such excellence, that the ship "hung" up there. Modelers will not make any mistake in building the Air Warden; it's one of the most efficient performers we have ever seen and at the same time it looks like an airplane.

Carroll Moon,  
Senior Director, The Sky-Scrapers.

**THE** Air Warden was particularly busy on the Sunday that club director Mr. Moon came out to see it fly. A few hours before he arrived a flight had been made with a 17 second motor run. Shortly after the takeoff the ship, hit for the clouds, climbing steeply in a wide left circle under power.

It seemed as though the motor would never cut; but finally the ship began a tell-tale lazy circle to the left. Far above the other ships it seemed to hang in mid-air while a slight wind carried it down the field. Apparently it was headed for the "last resting place of lost models," so we piled into the car and began the chase. After a wild 10-mile ride the ship was recovered and upon returning to the field we learned it had been in sight 32 minutes. Many other flights like this have been made since.

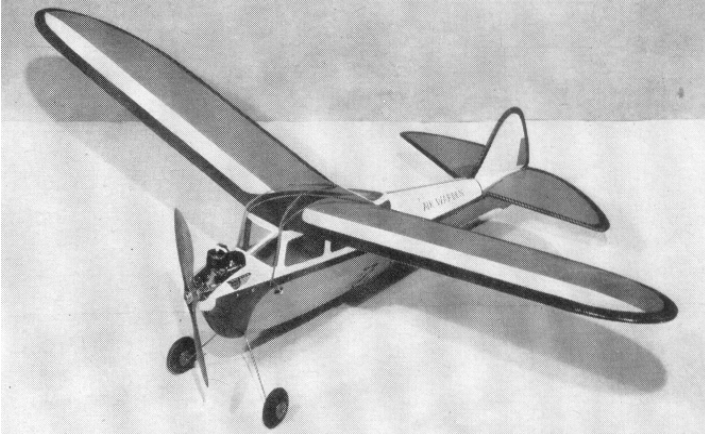
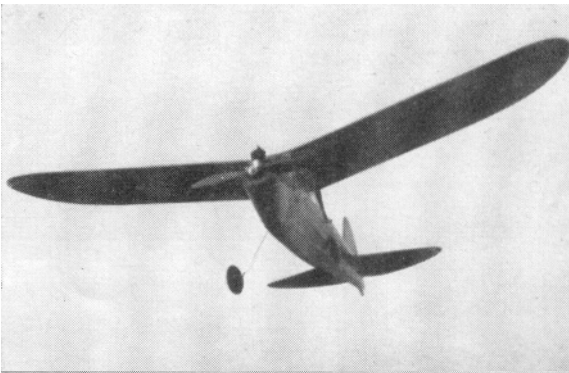
So here we proudly present a real contest ship that doesn't look like the dream of a madman. Due to fine aerodynamic design, similar to the "Meteor" appearing in the September issue of MODEL AIRPLANE NEWS, it gets the results that all modelers want - *real* performance.

**CONSTRUCTION** - Despite the fine curves, the sleek fuselage and general contour, the Air Warden is not difficult to build.

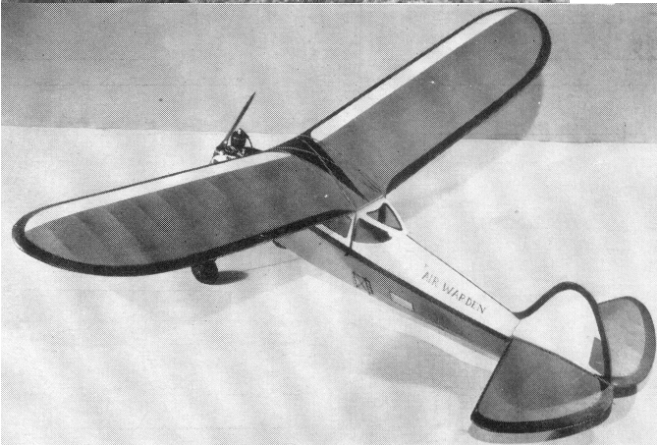
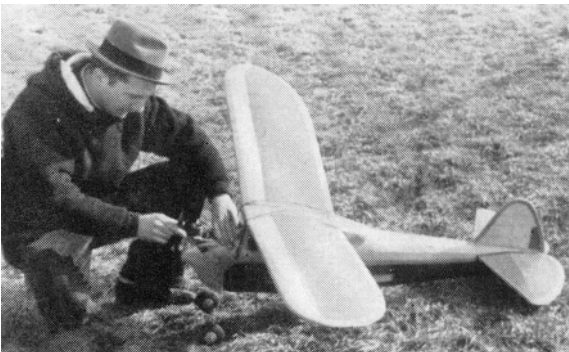
First make a full scale layout of the plane to simplify building and to reduce possibility of mistakes. Fuselage construction is built around a longitudinal "crutch," 44 inches long, formed of two stringers.

The balsa part, which starts with bulkhead No. 1 and continues to the rear of the ship, is of 1/4" x 3/4" medium stock. Note that it tapers from bulkhead F3 to a depth of 5/16" at the rear. This is a straight taper and represents a straight line from F3 to the rear, from the bottom upward. The gumwood motor bearers continue from F1 where they are spliced to the balsa crutch to the front. You will see that these bearers (which are of any hardwood 1/4" x 3/4") are notched and cemented to the balsa crutch. After both crutch sides have been cut and assembled, lay the pieces flat side down and insert the cross pieces in their proper places. Cement them thoroughly, and when they have dried, the hardwood filler pieces are cut and cemented in place. Let this assembly dry thoroughly, re-cementing all joints, particularly those near the F1 section. You will probably notice that at the point where the motor bearer meets the balsa crutch, the bearer will protrude slightly. Sand this down until the sides are perfectly smooth.

Now turn the crutch over so that the flat side is on top. For best results a piece of wood 2-7/16" wide should be lightly cemented across the front of the crutch to hold the assembly throughout the rest of the building process. It will greatly aid in maintaining the rigidity of the structure.



One of those rare ships having both good looks and fine performance. (Top) Gliding in after a trip to the clouds. (Below) Al tunes 'er up for a short flight of 6 minutes.



The next step is the cabin formation. This structure is built of  $3/16$ " x  $1/2$ " medium balsa for the uprights. The top of the cabin is  $1/4$ " square throughout. Note especially that the uprights are set in  $1/16$ " from the outside of the crutch. This is to allow for the covering of  $1/16$ " sheeting, which is part of the cabin. You will see that the firewall, F11 and F15, are also "cut-in" to allow for covering; the entire assembly greatly adds to the strength of the completed cabin.

However, do not put on the  $1/16$ " sheet at this time. After the outline of the cabin is in, cement F15 in place. Then cover with sheet from the middle of F14 to F15.

To complete the first step in the cabin, cut F20 from  $1/4$ " sheet and cement in place. You will see that notches are cut in F15, and that these have been covered by the  $1/16$ " sheet covering. Cut through the sheeting into the former to allow for the stringers which are coming up.

Your next step is to cut out formers F16, F17, F18 and F19 and cement them in place. Let them dry thoroughly and cement into place the  $1/8$ " square stringers, On the middle formers (16, 17 and 18), the notches are only  $1/16$ " deep and therefore the stringers extend  $1/16$ " above the curve outline: however, On F19 the notches are  $1/8$ " for at this point the stringers are flush with the arc of the former.

Now comes the firewall. The template for it is shown on the plans and you should take particular pains to follow the diagram as closely as possible. You'd better draw up a form for the landing gear and bend the gear of  $1/8$ " wire to follow the form exactly. Before cementing the landing gear in place, sand the firewall smooth and give it a coat of cement, rubbing it in well with the fingers.

When this has dried the landing gear is affixed. It is secured by grooved basswood strips  $5/16$ " x  $1/2$ ". This assembly may be made stronger by "sewing" the gear to the firewall with heavy thread or fishline Check the landing gear so the wheels will be level with the firewall. When the entire assembly is dry it should be cemented to the crutch. Now cement the  $1/8$ " x  $3/4$ " crosspiece across the crotch behind the wall. F11 is then put in and the  $1/16$ " sheet from the firewall back to F12 applied.

In forming the bottom, of the fuselage, your first step is building the bottom V's which act as formers. They are made of 3/16" x 1/2" medium stock from F1 to F4, and of 1/8" x 1/2" soft from F5 to F10. These should be cut, cemented and set aside to dry before being applied. Then they are inserted in their proper places; make sure they are at right angles to the crutch when finally in place. The ship may be placed bottom-side-up in this construction stage. The rear stem piece is then cut from 1/4" sheet and cemented in place.

The stringers on the fuselage bottom are of 1/4" x 1/8" medium balsa. If you closely follow the notches on the V's you cannot go wrong on this detail. From F7 back to the end the stringers are sanded until at the stempiece they are smooth with the pointed rear. The keel of 5/16" square is next cemented in place and you'll have to secure it with rubber until it has dried thoroughly. The tail skid of 1/4" sheet balsa (very hard) is next added.

The cowl is best formed from two pieces of medium balsa 2" x 5" x 5". If such size wood is not obtainable, several smaller pieces may be laminated. The side profile of the cowl is indicated by the cross-squared side view; the rear of the cowl takes its form from the firewall.

Cement the two pieces lightly together cut it out to rough shape (both profile and front view). Now place the block beneath the crutch below the motor bearers and filler and in front of the firewall. Mark with a pencil on top of the block the position of the outside of the bearer and the inside of the filler pieces.

Next separate the blocks and start carving. You must not cut the sides (at the top) within the space occupied by the bearer and filler pieces. Otherwise the cowl formation is simply a matter of cutting and sanding until you are ready to re-cement the two half pieces and cement the finished job to the firewall and bearer assembly. The top half of the cowling is formed from soft balsa blocks which are cemented to the firewall and bearer assembly and sanded to contour with the firewall as indicated.

The next step in completing the fuselage is to cover the cabin with 1/16" sheet. By careful application, taking plenty of time, this will result in a beautifully realistic job.

In forming the windows, cut the 1/16" sheet to window outline and cement it to a strip of celluloid, then cement the entire assembly in place. Next cut out the windshield and cement in its proper position.

As a final step in the fuselage, build the battery box, making sure it is solid and well constructed. Install this box, coil, condenser and timer, and wire the ship. Do this job carefully - it will save many hours of trouble on the field if the ignition circuit is electrically perfect.

Sheeting (1/8" soft balsa) is cemented between the firewall and F1, as shown on the plans. The wing and elevator holding dowels are inserted and firmly cemented. After a careful sanding the fuselage is ready for covering. Silk is preferred for covering the body; however, heavy bamboo paper may be used if silk is not obtainable.

**FLYING SURFACES** - Before building it will be necessary to scale up the plans for the rudder and stabilizer. This assembly is particularly rugged and if built properly will never warp or twist in any way. Construction is simple with a few special instructions. The trailing edge of the elevator is not tapered at the point it joins the rudder, merely rounded; it tapers from this point, however, to the trailing edge.

Scale up the wing plan before starting to build this important part. Build over the plans: but you will have to elevate the bottom spar 1/8" from the plan because of the rib undercamber. Ribs are fitted in their positions on the main spar and cemented in place. Next attach the leading and trailing edges.

Unless you already have tapered trailing edges it is best to sand these before assembling to the ribs. Cement the top spars in position, attach the wing tips, and after cementing the gussets in place allow each wing half to dry thoroughly. Be careful in making the center section; be sure the dihedral cuts are properly made and according to plan. Note in the center section that both top and bottom are sheet covered.

The halves are cemented together next. Your following step is to sheet-cover the leading edge. The cap strips extend from the end of the

sheet covering to the trailing edge. They are sanded down until they fair into the trailing edge.

Wings and tail assemblies are covered with light bamboo paper, if available. In an emergency almost any material may be used.

**TEST FLYING** - The ship should balance at a point approximately 1/3 of the chord behind the leading edge. Test glide the ship first before making a power flight, and if glide is too steep insert incidence beneath the leading edge of the wing. If the glide is stalling incidence should be inserted under the trailing edge of the wing, or under the leading edge of the elevator. Not more than 1/16" should be required for any adjustment. The motor should be mounted with 1 or 3 degrees of right thrust, to control torque effect. This should allow the ship to fly left under power. However, if the ship does not fly to the left under power, use a very slight amount of left rudder.

Understand that the Air Warden, properly built, will fly to the left under power and in the glide. To compensate for too much left turn under power, the right thrust is used. Usually the ship will fly to the left under neutral rudder; however, if it does not, you may have to use a very slight amount of left rudder.

**CONCLUSION** - When you have finished your Air Warden we know you will have a job to be proud of. It is unusually rugged and will stand all kinds of power, flying abuse and general knocking around. Aside from being built for performance and beauty it's a ship that can "take it." If you have any comments or wish advice on the ship write the author, in care of MODEL AIRPLANE NEWS

**VICTORY**

***Scanned from July 1942  
Model Airplane News***