



Daydreamer

By Bob Wallace

**This 3-Channel Sport Flier
Makes An Ideal Trainer,
Or Is Great For Just
Relaxed Easy Flying**

Many sport R/C aircraft construction articles commence with a glowing testimonial to the virtues of a particular design. Just to temporarily be a bit different, I will start by telling the reader the things that the Daydreamer is not, or cannot do.

While mildly aerobatic, the Daydreamer will not perform every pattern maneuver. It does not fly fast, and it is not likely to win any beauty contests. It cannot be built on Saturday and flown on Sunday, nor is it crashproof or indestructible.

On the positive side, the Daydreamer is a very easy and inexpensive to build and fly sport design. Stability, combined with mild acrobatic capability, at a leisurely speed, are the Daydreamer's strongest in-flight virtues. Being a hand-launched design, with honest "slow-poke" landing qualities; it can be flown from any



NAME
DAYDREAMER

Designed by:

Bob Wallace

TYPE AIRCRAFT

Sport

WINGSPAN

63-3/4 Inches

WING CHORD

7-1/2 Inches (Avg.)

TOTAL WING AREA

478 Sq. In.

WING LOCATION

Low Wing

AIRFOIL

Flat Bottom

WING PLANFORM

Double Taper

DIHEDRAL, EACH TIP

2-1/2 Inches

OVERALL FUSELAGE LENGTH

38-3/8 Inches

RADIO COMPARTMENT SIZE

(L) 9" (W) 1-13/16" (H) 1-3/4"

STABILIZER SPAN

20 Inches

STABILIZER CHORD (inc. elev.)

5-1/4 Inches (Avg.)

STABILIZER AREA

100 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Top Of Fuselage

VERTICAL FIN HEIGHT

6-3/8 Inches

VERTICAL FIN WIDTH (inc. rud.)

4-3/8 Inches (Avg.)

REC. ENGINE SIZE

.09-.10 2-Stroke

FUEL TANK SIZE

1 Oz.

LANDING GEAR

N/A

REC. NO. OF CHANNELS

3

CONTROL FUNCTIONS

Rud., Elev., Throt.

C.G. (from L.E.)

2-1/2 Inches

ELEVATOR THROWS

1/2" Up — 1/2" Down

AILERON THROWS

N/A

RUDDER THROWS

1-3/8" Left — 1-3/8" Right

SIDETHRUST

2 Degrees

DOWNTHRUST/UPTHRUST

4 Degrees Down

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa, Plywood

Wing Balsa

Empennage Balsa

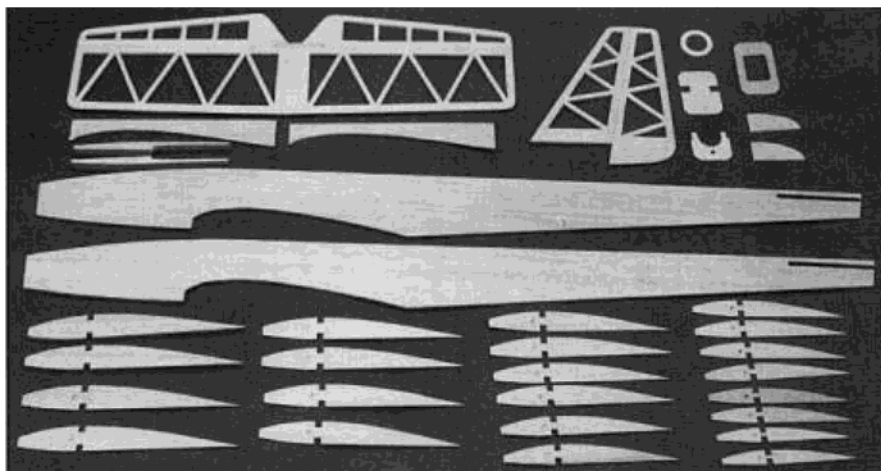
Wt. Ready To Fly 31-1/2 Oz.

(1 Lb. 15-1/2 Oz.)

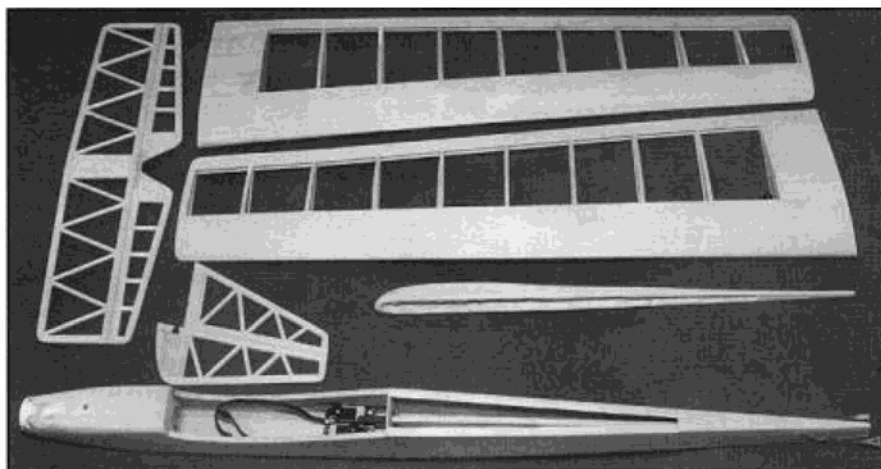
Wing Loading 9.5 Oz./Sq. Ft.

small open area. Its simple construction methods render it an ideal design for the first time scratch-builder.

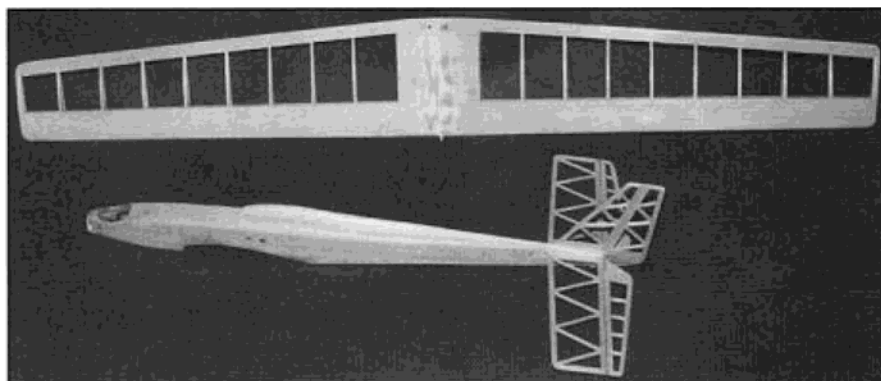
The Daydreamer's docile in-flight traits will be well appreciated by the relative newcomer to R/C flying. Other than as a change of pace type of aircraft, the experienced R/C pilot will perhaps find the Daydreamer to be a rather "ho-hum" performer, unless he/she simply enjoys low key rambling about the skies in a very economical and leisurely fashion.



The "kit"! All the necessary cut parts plus the assembled tail surfaces.



The basic subassemblies. Note top rear fuselage sheeting not in place yet.



Wing panels have been joined together and tail pieces attached to the fuselage.

The Daydreamer shown in this construction article was originally powered with a Russian MK-17 (.09 cu. in.) diesel engine. However, any of the presently available .09-.10 cu. in. glow plug equipped engines would perform equally well. The use of a throttle equipped engine, while not necessary, is left up to the builder. There is sufficient space within the fuselage cavity to accept three servos.

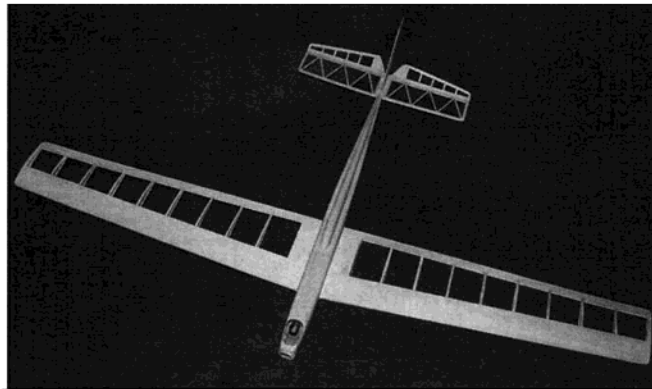
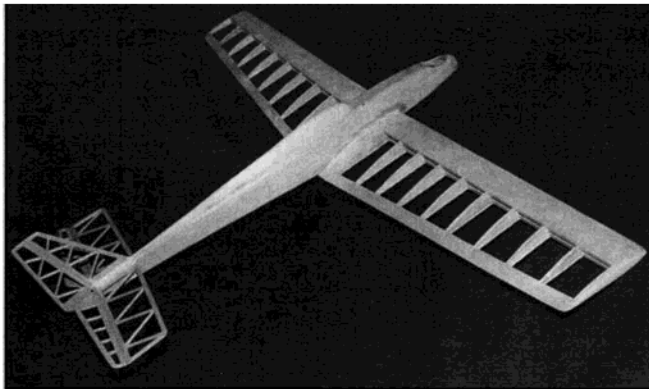
CONSTRUCTION

As with any scratch-building project, it is of great benefit to cut out all of the various wing ribs, bulkheads, formers, fuselage sides, etc., prior to starting the actual assembly process. In effect, the builder is first creating his/her own kit.

This makes the actual construction phases less interrupted and more enjoyable. As the plan sheet clearly indicates, the Daydreamer is a simple, easy to assemble aircraft that goes together quite rapidly.

As the wing requires the most time to construct, let's start with that first.

Place the wing panel plan sheet over your flat building surface and cover it with either wax paper or clear vinyl sheeting. The disposable clear backing sheet from heat shrinkable film covering material is ideal for this purpose. Pin the lower leading and trailing edge sheeting in place, along with the lower center section sheeting and lower rib capstrips. Glue all the respective sheeting seams and joints with cyanoacrylate adhesive. When dry, unpin the trailing



The completed airframe, ready for covering.

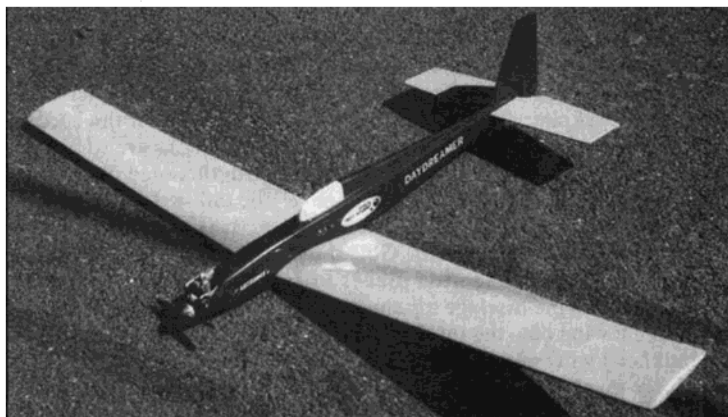
edge sheeting at the tip area and shim it up with the tip washout strips. Re-pin the shimmed up trailing edge sheeting back to the building surface. The upper and lower wing spars and all wing ribs are now pinned in place. Check for proper alignment of all ribs, making certain that the center section end rib is angled properly to produce the correct dihedral angle. Use the dihedral angle template on the plan sheet to set the center rib at the proper angle. Glue the spars and ribs in place. Unpin the leading edge sheeting, as required, and shim this sheeting up to match the slight upward curvature of the front portion on the bottom of each wing rib. Glue the leading edge sheeting to the ribs. The leading edge is now pinned and glued in place, after first beveling it to match the bottom sheeting/rib nose angle. When dry,

bevel and block sand the top of the leading edge to match the curvature of the wing ribs. Glue the vertical grain shear webbing in place in the indicated rib bays, along with the wing mounting bolt filler blocks. The top leading and trailing edge sheeting, center section sheeting, and rib capstrips can now be pinned and glued in place. When dry, remove the wing panel from the building board and glue the tip block in place. Sand the completed wing structure to the indicated finished airfoil shape.

The other wing panel is now constructed in the same fashion. When both wing panels have been completed and sanded to shape, join them together at the proper dihedral angle. Use your flat building surface for this step, making sure that the two wing panels are true to one another with no built-in twist other than the specified wingtip

washout, in each wing panel. To accomplish this, simply measure from several equally distant points (from the wing center section joint) along the leading and trailing edges to your flat building surface. With the wingtips on each wing panel shimmed up to the equal dihedral heights, the vertically measured points along each wing panel should match those of the other wing panel. An incidence meter can also be used during this step, but is not required.

The wing center section is now reinforced with a 3" wide strip of 2 oz. fiberglass cloth and epoxy resin on both the top and bottom surfaces. Blot off all of the excess resin with either toilet paper or a paper towel. When dry, lightly sand the center section reinforcing band to remove any high spots. Lightweight spackling compound can be used to smoothly feather the fiberglass



The Daydreamer is one of Bob's latest diversions from inking plans for RCM, and competing in FAI Pylon Racing. Though it looks "racy," the Daydreamer is a simple 3-channel sport flier. A real fun airplane!

reinforcing band into the wing, or to fill any general wing surface imperfections.

Fine sand the entire wing, but do not install the leading edge wing mount dowel yet.

The tail surfaces are easily constructed directly over the plan sheet, using the indicated balsa wood sizes.

Remove the tail surfaces from the building surface and cut the hinge slots into the respective surfaces at the locations shown on the plans. Install the hinges, but do not glue them in place at this time, as it is easier to permanently install them after these surfaces have been glued in place on the fuselage and covered. Fine sand the tail surfaces to the indicated shapes.

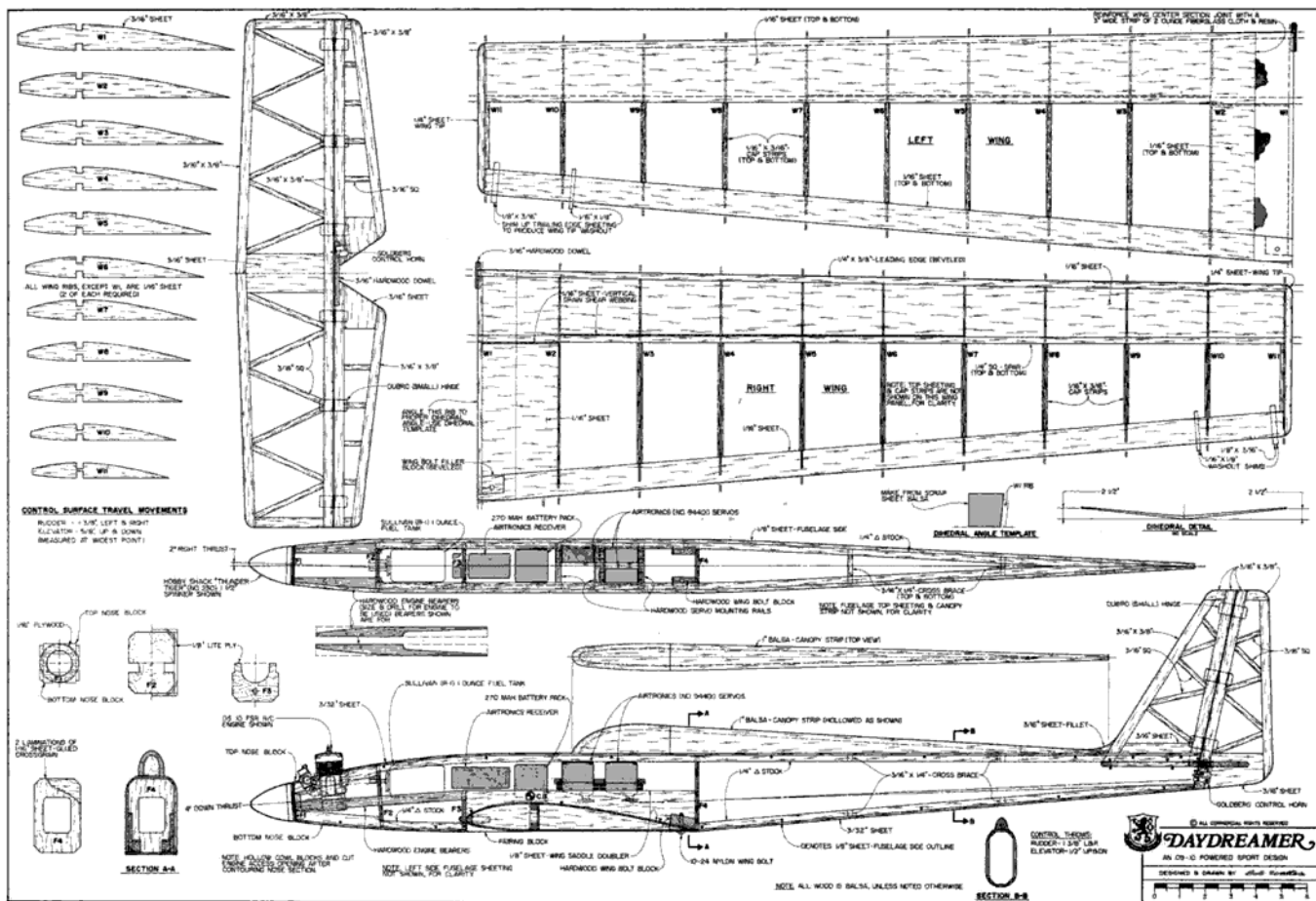
The fuselage is assembled by first marking the former and engine mounting

beam locations onto the precut fuselage sides. Glue the engine mounting beams in place on both fuselage sides. (The slight curvature of the outer face of the mounting beams will produce the necessary fuselage side nose curvature to accept the plywood nose ring.) Be sure to make a "left" and a "right" hand fuselage side! Glue the fuselage formers in place on one fuselage side, making sure that they are 90° to the side. Glue the other fuselage side in place, making sure that it is properly aligned with the other side. Draw the fuselage sides together at the tail end, and after making sure that the fuselage curvature is symmetrical, glue the sides together at this point. Glue the fuselage cross braces in place along with the hardwood wing bolt

blocks. The engine mounting beams are now to be drilled to accept the engine. The engine should first have all of its openings sealed (exhaust, venturi, and fuel nipple), to keep out all foreign matter.

The plywood nose ring is now attached to the backside of the spinner backplate with scrap 1/16" balsa spacers between them. Rubber cement works well for this, as these pieces are to be separated once the plywood nose ring is glued in place.

Install the spinner backplate/plywood nose ring unit onto the engine and position the engine on the beam mounts. The fuselage right side and engine mounting beam (front face) will have to be trimmed slightly to allow for the 2° of right thrust in the engine alignment. With the engine proper-



ly positioned on the beam mounts and the plywood nose ring firmly against the fuselage sides, carefully mark the engine mounting hole position on the beams, and also glue the nose ring in place. Remove the spinner backplate, 1/16" balsa spacers, and the engine. Drill the engine mounting hole and install the 4-40 blind nuts in the bottom of each hole. Reinstall the engine and spinner to be sure that the nose ring and engine are aligned correctly. Glue the triangular stock nose section pieces in place along with the fuselage top sheeting. Position the wing onto the fuselage. Using the bulkhead wing dowel hole as a guide, carefully mark and then drill the wing dowel hole into the leading edge of the wing. The hardwood wing dowel is now glued into the wing, with the wing firmly

positioned onto the fuselage until the glue dries. With the wing still in place in the fuselage wing saddle, mark and drill the holes for the rear wing mounting bolts. The size of the drill will be dependent upon whether the hardwood wing mount bolt blocks are to be tapped or equipped with threaded inserts or blind nuts. Glue the tail surfaces in place on the fuselage, making sure that they are properly aligned with the wing. Remove the wing and install the fuel tank, radio equipment, and control pushrods prior to installing the fuselage bottom sheeting.

Be sure that the control pushrods are straight with no significant offset bends, and that they operate smoothly without binding. The radio antenna can also be routed through the fuselage, exiting at the tail,

using a piece of nylon or plastic tubing as a conduit. This antenna routing method will not have an adverse effect on radio reception, and is certainly a neater and better looking installation than that of simply exiting the antenna from the fuselage near the wing and attaching it to the tail.

Another antenna option is to employ a Deans Co. base loaded antenna within the fuselage. These compact antenna units perform equally well, and eliminate the unsightly antenna wire hanging outside the aircraft.

The fuselage bottom sheeting, nose block, and wing fairing block are now glued in place. Carefully shape and sand the fuselage to the proper contour. The nose curvature should smoothly blend in with the spinner contour. The fuselage top "canopy" strip is now assembled, shaped and sanded, and glued in place.

Finish sand and vacuum clean the entire aircraft in preparation for finishing.

FINISHING

In order to keep the aircraft as light as possible, the use of any of the popular heat shrinkable film covering materials is highly recommended on the wing and tail surfaces. The fuselage may also be film covered or painted. If film covering is to be used on the fuselage, all final exposed wood areas should first be coated with a fuelproof sealer. The Daydreamer shown in this article was finished with Top Flite EconoKote film covering.

Relative to finishing with a plastic heat shrinkable covering material, the builder is advised to simply follow the manufacturer's

nstructions. An attractive, lightweight finish should result.

When the aircraft has been finished, locate the C.G. as indicated on the plan sheet, by positioning the radio receiver and battery pack as required within the fuselage.

Our completed Daydreamer, ready to fly (less fuel), weighed in at 32 oz.

As mentioned, our original aircraft was powered with a Russian MK-17 (.09) diesel engine, equipped with a Master Airscrew 3 x 4 prop. A 1 oz. fuel tank was used. (A second Daydreamer model was powered with an Enya 09, throttle equipped, R/C engine.)

An Airtronics module radio system was employed for our Daydreamer with three No. 9440 servos and a 270 mAh battery pack.

FLYING

Upon arrival at the flying field for our initial test flights, we first proceeded to conduct the usual preflight test. This consisted of a cursory radio system control movement and range check, and engine needle valve adjustment. We then just filled the fuel tank, and went.

The "jog and heave" method of hand-launching usually seen at most R/C flying fields for wheel-less types of aircraft, just isn't necessary with the Daydreamer.

Smooth, stable hand-launches are easily accomplished by the pilot using simple "flick of the wrist" level launches while standing stationary.

Our initial test flight was devoid of the usual apprehensions that are frequently

associated with the maiden flight of a new aircraft. On the first flight, we had to add a few clicks of down trim to the elevator and a bit of right rudder. We also ultimately reduced the elevator travel limits. The indicated rudder and elevator travel limits are suggested as a starting point for the builder, who may wish to adjust these movements to suit his/her own flying preferences.

The maiden, and subsequent test flights, confirmed that the Daydreamer is a docile, easy to fly aircraft. With its gentle in-flight characteristics, it is only mildly aerobatic. Loops, very leisurely barrel rolls, Cuban eights, Immelmann turns, etc., can be performed, and the Daydreamer will fly inverted, although lots of "down" elevator and "playing"

the rudder are required to keep it inverted. The Daydreamer possesses a very slow, sailplane-like landing speed, and with a mild headwind, landings can be made at zero ground speed.

Other than as a change of pace aircraft, the Daydreamer will probably not appeal to the high performance oriented modeler. However, if low key, relaxed, leisurely meandering about the sky is your idea of sport flying fun, then the Daydreamer would be an ideal choice.

The R/C modeler who has never "scratch-built" an aircraft from plans will also find the Daydreamer to be an easy first time project.

Good luck, good flying, and may all your landings be gentle and intentional.



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