DOUBLE EAGLE

By George R. Smith

**What is it?
It's a truly exciting new pattern ship that not only looks different, but has such ultra high performance that it may interest the U.S.A.F.**

enough. The aerodynamic "fine points" that would be primarily responsible for those special "think for itself" flight characteristics would be easily masked to totally obliterated by a warp or a slight misalignment. So, it follows that the airframe design and the assembly methods would have to conform to a rigid concept of built-in accuracy. One example of built-in accuracy is, **all alignment measurements must be made from the same reference throughout construction with no transfer of datum.** Other examples of built-in accuracy will be discussed during the "construction" portion of this article. The built-in accuracy concept contributed much to the "why is it" of the airframe and structural design and dominated the construction and assembly procedures — to produce a winning pattern aircraft.

How is it? A discussion is in order concerning the design philosophy of the Double Eagle and what is behind its ability to accomplish some of its almost startling flight performance. I won't clutter up the discussion with any formulas or mathematical justifications which, at this point, are relatively meaningless but I will attempt to explain why the various aspects of the design do what they do.

Powerplant — The Double Eagle was sized to be an all-out performer with a "hot" .61 engine and to be almost unchallengeable with the addition of a piped Schneurle engine. The design was developed around a Veco .61 with Perry Pump and Carb., customized with PDP ala Clarence Lee. The development proved so promising that the prototype of the final design was completed and tested using that powerplant. With its sleek lines, low-drag aerodynamics, and 9½ lbs. flying weight, its speed and vertical performance are truly spectacular. With the design now proven, two of the identical aircraft with only slight modifications to accommodate piped engines are now in the works, and will soon be off the boards and flying.

Low Drag Design — Of all the factors that produce aerodynamic drag on an aircraft, the greatest, and most difficult to reduce is the drag that is "induced" by the production of lift. Of lesser severity, but still with great affect, are the frontal area (flat plate) drag, the "profile" or skin friction drag, and the various parasite drag producers such as: open wheel wells, exposed wing-bolt heads, etc.

The Double Eagle was specifically designed to reduce the major drag producers to a minimum. The basic wing section was chosen for its excellent high-speed/low induced drag characteristics. Also, its relatively thin airfoil section provides a mininum of frontal area drag. The mounting of the wing with its upper surface coincident with the top surface of the fuselage provides a smooth airflow transition and eliminates the traditional wing to fuselage buffet area which usually can be only partially helped with transitional fillets. The wash-out in the wing, though primarily designed to enhance low-speed stability, provides a considerable contribution to a reduction in the induced drag during high-speed flight; with this airfoil, the reduced angle of attack at the tips slightly reduces total lift but greatly reduces the overall induced drag of the wing. The configuration of the wing tips with the extended span at the trailing edge help to minimize vortex losses and the accompanying tip drag.

The total frontal area of the aircraft has been reduced to the minimum; note that the cross section of the front end is about the size of the average .40 powered pattern ship. The profile and parasite drag has been reduced wherever possible.

The simulated intake ducts at the fuselage transition forward of the wing are obvious "flat plate" drag producers but the structural and aerodynamic advantages of these ducts far outweigh the small amount of drag produced. The structural advantage is obvious from the plan; they provide support for the extremely long nose. They substantially break up the helical flow of air around the fuselage from the propeller wash thereby helping to provide a straight air flow over the wing center section, over the upper fuselage, to the vertical fins, and also, the sharp leading edge of the simulated ducts greatly assist the stall characteristics of the wing. At stall speeds, it forces the wing to stall first at the root section and, in conjunction with the wash out, assists in assuring a progressive stall from the root to tip. This allows the full availability of lateral control with aileron, even when the wing is almost completely stalled and the aircraft is in its landing flare.

Slow Landing Speed — Given a high speed/low drag airfoil and a low drag/high powered airframe, the attainment of really impressive flight speeds should not be any surprise. The Double Eagle is not the usual aircraft; and what is surprising, after watching the Double Eagle in flight performance, is seeing a power-on, nose high landing approach that you can almost walk beside.

Stall — The rock steady power on slow flight capability is a direct indicator of the stall characteristics of the Double Eagle. With power off, the stall speed is a little slower than you would expect from a high speed aircraft, but not too much slower. The stall is clean but not abrupt, and is dead straight ahead.

Symmetrical Lift — For an aircraft to roll inverted and maintain altitude and direction, the forces on it must be the same in the inverted condition as they were in the upright condition.

The design of the Double Eagle capitalizes on the unsymmetrical aspect of the wing due to wash-out to produce a wing with symmetrical **lift** rather than a wing with symmetrical airfoil. The root section is a symmetrical airfoil. The tip section is an airfoil that is similar in contour to the root section on the upper surface but distinctly different on the bottom surface. Notice that "wash-out" in the upright condition changes to "wash-in" in the inverted condition and the resultant angle of attack at the tips is decidedly positive. The bottom surface is designed to use that positive angle of attack when inverted to provide a significant amount of lift.

When the aircraft is upright, straight and level flight is maintained primarily by the lift generated by the inboard portion of the wing. The outboard portion, being appropriately "washed-out" to produce less lift and substantially less drag, is really going along for the ride. In the inverted condition, with no change to the straight and level attitude of the aircraft, the generation of the primary lift shifts to the outboard portion of the wing which is not blanked by the fuselage and which has a significantly high angle of attack.

The symmetrical lift on the Double Eagle is dependent upon a critical location of aircraft Center of Gravity (CG). That is to say, the CG, once established and trimmed for, must remain fixed within precise limits for the symmetrical lift feature to be effective. A CG location of 40%—42% of the mean aerodynamic wing chord (MAC) will provide adequate pitch stability and still allow excellent maneuverability both in the inverted and upright conditions. The dual tank arrangement devised for the Double Eagle allows for a full 16 ounce of fuel but still provides a localization of fuel mass which is adequate to maintain the CG well within limits. The slight lateral fuel mass shift from tank to tank during fuel utilization is totally insignificant in flight.

Lateral Lift — Lateral lift is the lift provided by the fuselage in lateral flight. The design of the Double Eagle's forward fuselage provides approximately 65 square inches of lifting surface that is forward of and unencumbered by the wing. If the reader has been wondering why the Double Eagle has such an extremely long nose, this is the reason. The lateral area of the forward fuselage was sized and the aerodynamic contour was developed to produce an adequate lateral lift to maintain straight and level flight at the higher speed ranges. As with the symmetrical lift, don't expect adequate lateral lift for slow speed knife-edge flight. Keep the speed up to keep out of the ground.

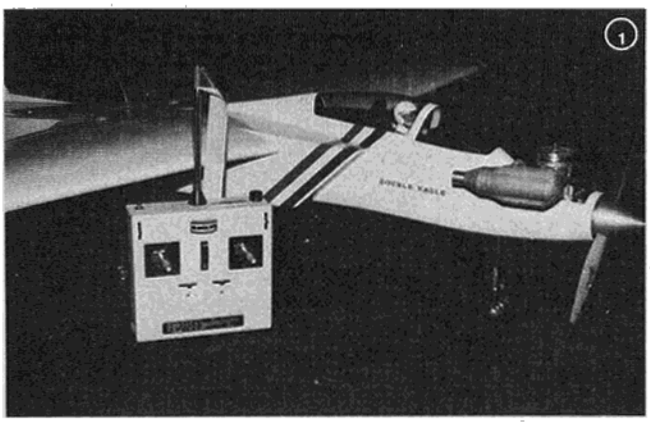
Twin Fins — The twin vertical fins were put into the design to satisfy a need for yaw stability. The 65 square inches of lateral area of the nose is considerably larger than the nose area of any conventional pattern aircraft. The negative yaw moment created by the nose is in proportion to its size — large! The vertical fin area that would be required to establish an adedquate positive yaw stability, if relegated to a

DOUBLE EAGLE

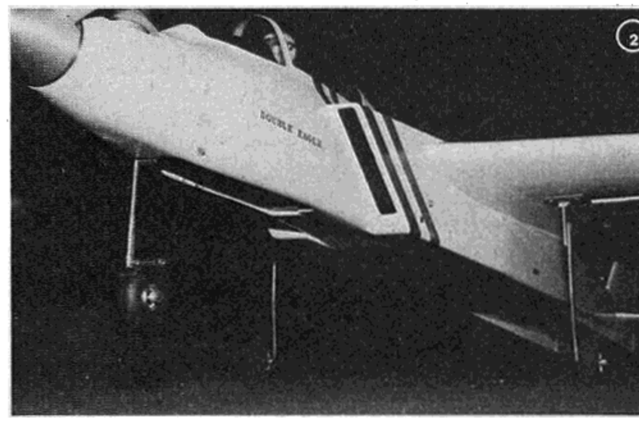
Designed By : George R. Smith

TYPE AIRCRAFT
Pattern
WINGSPAN
62 Inches
WING CHORD
Root 15" — Tip 7½"
TOTAL WING AREA
675 Square Inches
WING LOCATION
Shoulder Wing
AIRFOIL
Semi-Symmetrical
WING PLANFORM
Double Taper
DIHEDRAL, EACH TIP
3/8" at Chord Line
OVERALL FUSELAGE LENGTH
57⅜ Inches
RADIO COMPARTMENT AREA
(L) 8" x (W) 6½" x (H) 2½"
STABILIZER SPAN
27 Inches
STABILIZER CHORD (incl. elev.)
Root 9" — Tip 4¼"
STABILIZER AREA
172 Square Inches
STAB AIRFOIL SECTION
Symmetrical
STABILIZER LOCATION
Mid-Fuselage
TWIN VERTICAL FIN HEIGHT
6⅝ Inches
VERTICAL FIN WIDTH (incl. rud.)
7½" (Avg.)
REC. ENGINE SIZE
Schneurle .61 w/pump
FUEL TANK SIZE
16 Ounces
LANDING GEAR
Tricycle Retracts
REC. NO. OF CHANNELS
5
CONTROL FUNCTIONS
Rud. Elev., Throt., Ail., Retr.
BASIC MATERIALS USED IN CONSTRUCTION

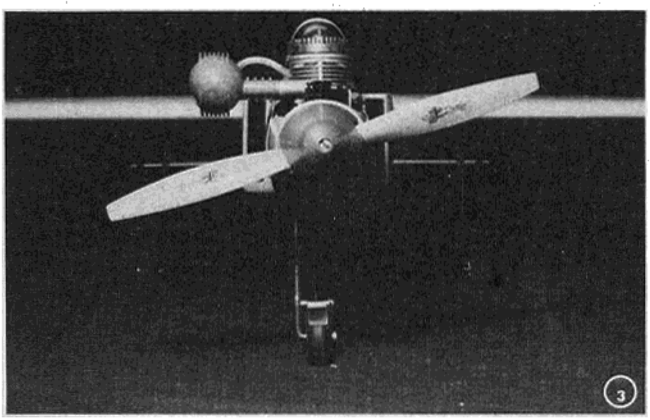
Fuselage	Balsa & Ply
Wing	Foam & Ply
Empennage	Foam, Ply & Balsa
Wt. Ready-To-Fly	152 Ounces
Wing Loading	32.4 Oz./Sq. Ft.



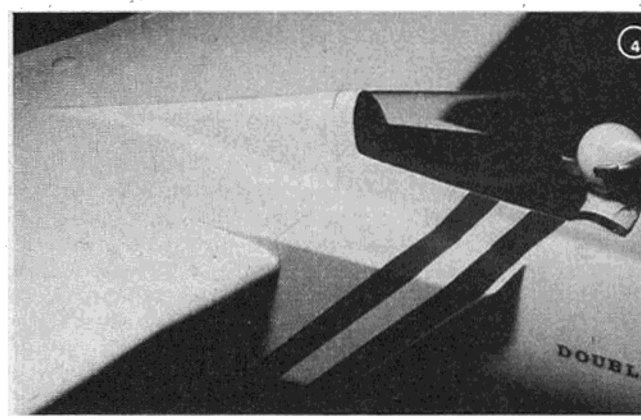
(1)



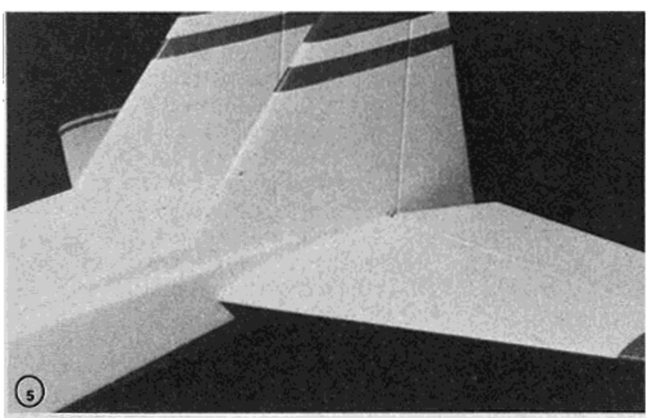
(2)



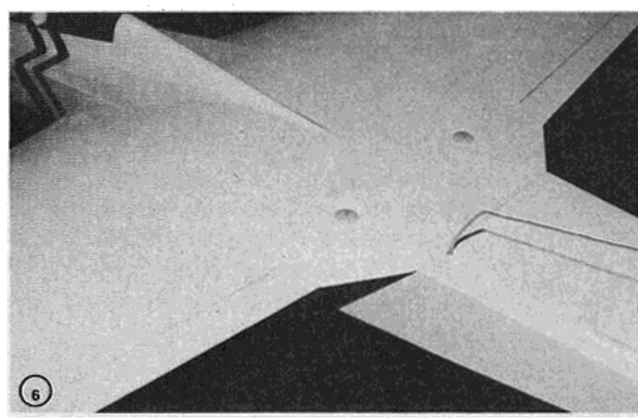
(3)



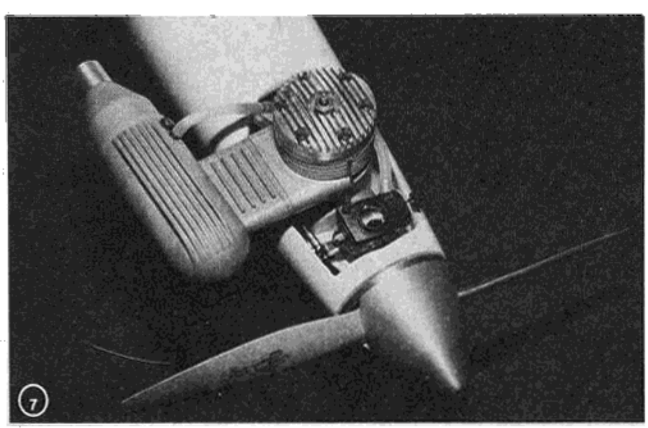
(4)



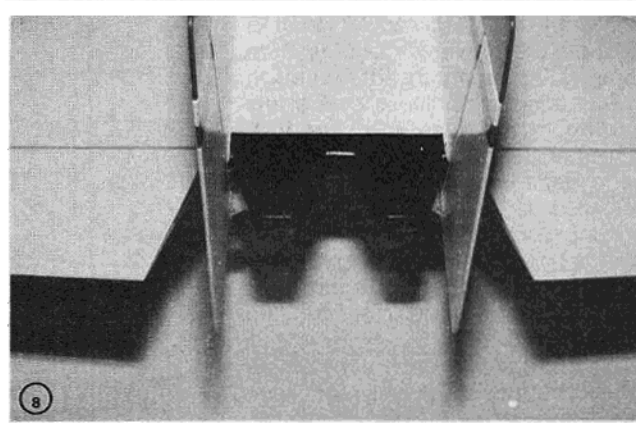
(5)



(6)



(7)



(8)

(1) The forward section of the fuselage has 65 sq. in. of lateral lifting area to sustain altitude in knife-edge flight. (2) The simulated intake ducts stop the helical propwash and help to straighten the air flow over the wing center section. (3) The extremely clean front end helps to minimize drag. (4) A Wing Mfg. Co. "Sport" style canopy blends perfectly into the aerodynamic contour of the fuselage. (5) The twin vertical fins are aerodynamically functional; they are not just for looks. (6) The wing contour is coincident with the top of the fuselage, thus eliminating the traditional wing to fuselage buffet area. (7) Superb performance on prototype using a K & B .61 with Perry pump and carb. Engine shown was customized by Clarence Lee. (8) The stab has a symmetrical airfoil for efficiency and is sized for positive pitch stability.

single surface, would make it look like it came off of a C-5A. Therefore, the required total area was split in half and put into two surfaces. The area was then proportionately assigned above and below the CG level to provide true yaw response and to minimize roll coupling. All other aspects of the design that deal with flight dynamics are pretty standard.

A fully aerodynamic horizontal stabilizer with symmetrical airfoil was provided for efficiency and was sized for positive longitudinal stability.

All surfaces and the engine thrust line are set at 0-0 degrees.

The wing is designed to have a very slight dihedral, actually, the amount of dihedral is only to assure that there are no anhedral characteristics.

All control surfaces are close-hinged, with **no** hinge gap, for control efficiency and reduced drag.

Structure — A brief discussion of the structure of the Double Eagle is in order, to complete the "How is it" portion of this description and to show how the structural design complements the aerodynamic design.

The fuselage forward section is a conventional beam-mount structure designed to retain its stiffness in spite of its extremely long nose moment and slender cross section. The beams carry the primary load and are assisted by plywood doubled sides. Hollowed out top and bottom blocks complete the contour. The beams are hardwood, are shaped to establish the lateral lift contour, and are notched to provide accurate alignment of the bulkheads. The canopy is, of course, non-structural but its contour is an integral part of the lifting body shape.

The fuselage aft section has a rectangular cross section and is stiffened by a dual crutch which also distributes the load applied to the top of the fuselage by the twin vertical fins.

The forward and aft sections are coupled by the wing saddle which is stiffened by plywood doubled side pieces. The wing saddle section provides adequate stiffness to resist any bending in the fuselage, but it is somewhat dependant upon the wing center section to provide additional resistance to torsion. The wide setting of the wing support dowels and screws assist in providing torsional rigidity and is much more effective than mounting the same attachments closer to the aircraft centerline.

The wing and horizontal stabilizer are similar in structure: polystyrene foam cores covered with 1/64" plywood. Plywood was chosen for the rigid surface because it is as light as 1/16 balsa and is stronger.

In the horizontal stabilizer, enough of the foam is cut away for the installation of a tip-to-tip spar which becomes integral with the fuselage aft structure at assembly.

Construction and Assembly

The construction and assembly methods and techniques that are suggested for the Double Eagle were devised for the express purpose of imparting the built-in accuracy to the assembled aircraft that is required to take advantage of all the aerodynamic fine points just discussed. The structure was designed to utilize these techniques and the ease with which extreme accuracy can be obtained by using them will be surprising.

A flat building surface that is large enough to accommodate the assembled aircraft is desirable but not absolutely necessary. The "flatness" of the surface is mandatory; the size is according to relative convenience. It is necessary, however, to have enough total area capability for the assembled aircraft to sit flat on the surface and for enough of the aircraft to be over the surface for vertical measurements to be taken.

The builder will need a foam cutter capable of cutting a 30" wing panel. (I heartily endorse the RCM design. I have used one for at least 20 wings and I like it.) The foam cutter should be mounted above and used in conjunction with the flat assembly surface to assure trueness.

The idea is to build everything on the flat surface and impart its accuracy to the aircraft. The fuselage is built with the bulkheads sitting on the flat surface; the wing and stab are fitted to the fuselage and aligned to be paralled to the flat surface; the vertical fins are added and made to be perpendicular to the flat surface. After **all** alignments are completed, the bottom plate can be added to the fuselage, sanded to contour, and it's finished.

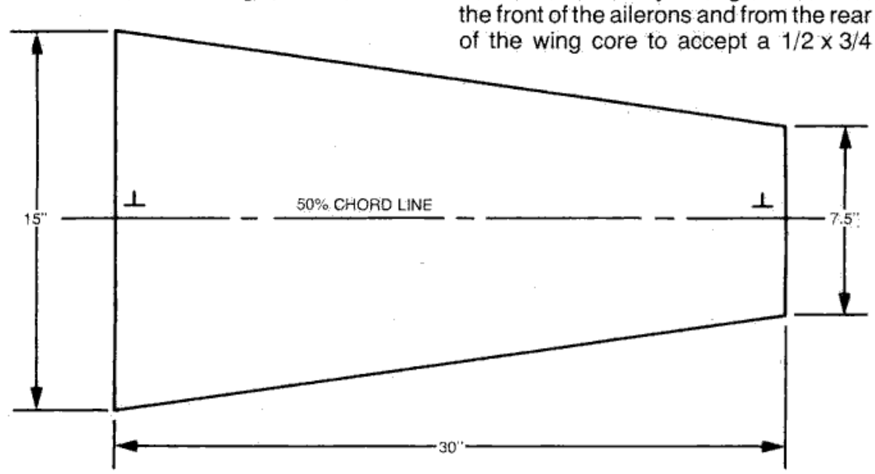
Wing — The wing cores are cut from a solid block of medium density polystyrene foam. The foam blocks should have smooth, parallel surfaces and should be at least 3" thick (4" would be even better) since we're going to use the top and bottom "waste" as construction molds.

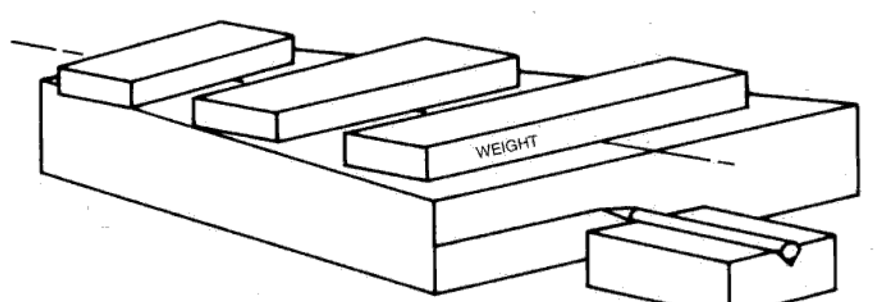
Accurately cut a planform of each wing panel, including ailerons. Be certain that the root and tip cuts are exactly square with the top and bottom surface. Note that the 50% chord line is perpendicular to the centerline of the aircraft so that the fore and aft wing taper is symmetrical.

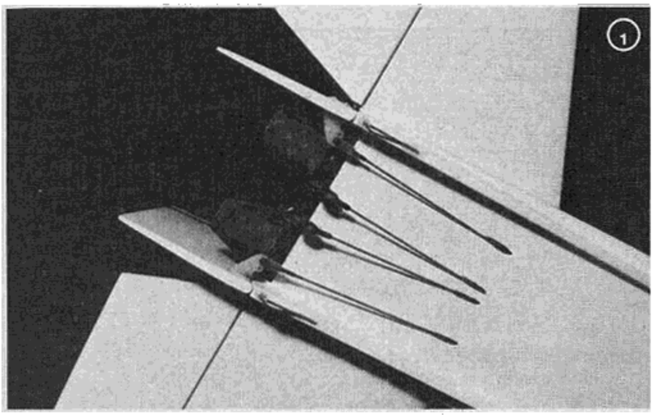
With the wing blocks weighted down on the flat surface, and using a marking gauge, made as shown, mark the chord line on the root end of both foam blocks. All marking should be done with a fine line felt tip or ball point pen and done with extreme care and accuracy.

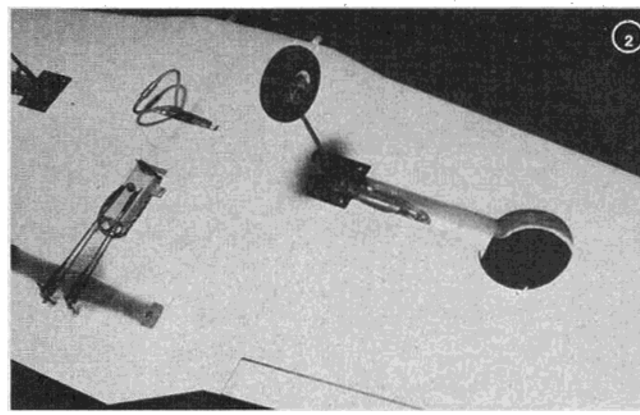
The chord line is to be marked on the tips in the same way, **except** that it is done with a 3/8" spacer under the marking gauge. This will provide the exact amount of dihedral in the assembled wing. Make your airfoil templates as accurately as possible, using 1/32" plywood or phenolic, and include the aileron. The root template must be exactly on chord line. The tip template is placed with the nose end exactly on the raised chord line but with its tail end 0.15" **above** the raised chord line. This is the wash-out and it must be exactly the same on both wing panels. Take care to place the 50% points of both templates on the 50% chord line.

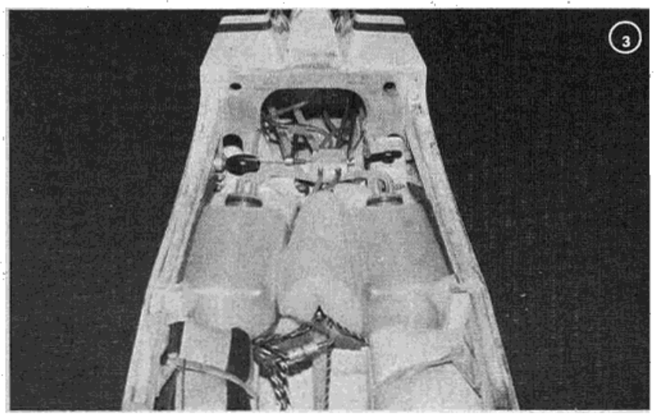
Carefully mark and cut away the ailerons. Trim away enough foam from the front of the ailerons and from the rear of the wing core to accept a 1/2 x 3/4

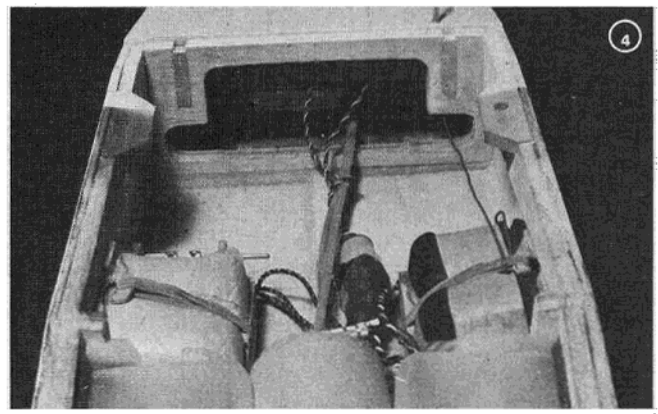


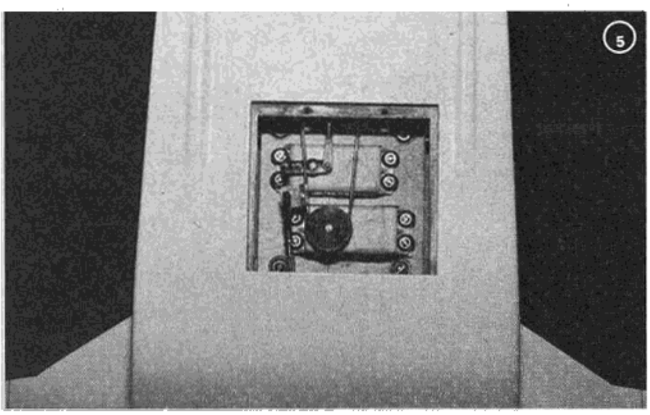












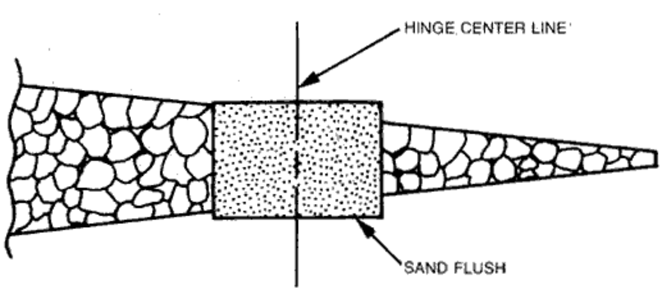
(1) Bottom view of elevator and dual rudder pushrods. Note wire skids on sub fins. (2) The main gear retracts outward to maintain good gear-down geometry. (3) Ample room inside for dual fuel tanks and radio equipment. Dual tanks help to localize the fuel mass at the C.G. (4) Inside of fuselage looking aft. Everything strapped in place. (5) Hatch removed on bottom of fuselage to show rudder and elevator servos.

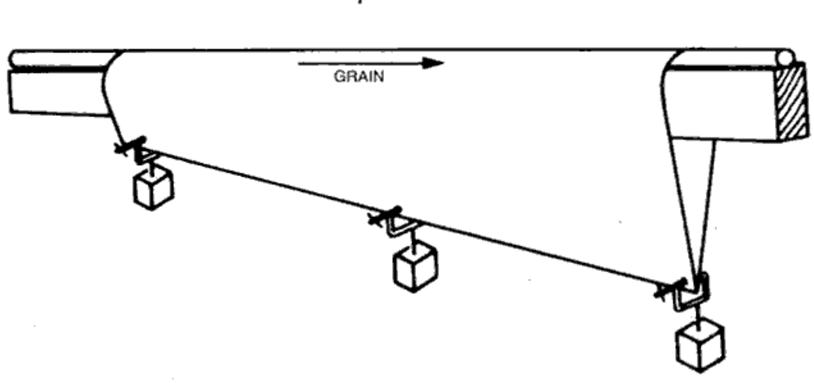
balsa hinge support to be centered on the proposed hinge line.

Using Hobbypoxy No. 2 or Titebond, glue the hinge support to the rear of the wing core. Use care to keep the core straight. When dry, carefully sand the balsa flush with the top and bottom surface of the foam, maintaining the contour as accurately as possible.

While the panels are drying, you can prepare the landing gear mounts. I prefer a 1/4" plywood mount recessed into the foam. Your favorite method, or a commercial mounting would be fine also. After the wing cores have dried thoroughly, carefully measure and remove just enough foam to allow the mounting to lay flush in the core and epoxy in place.

Each half of the wing will be covered with a single piece of 1/64" plywood, joined at the trailing edge. The grain is to be aligned with the leading edge. To





prepare the plywood, align the leading edge over a 1/2" dowel that has been backed with a piece of 1" x 2" for strength, wet down the leading edge, hang weights on the plywood (using "C" clamps), and let it dry.

Slightly thin approx. 1/8 pint of Hobbypoxy 2 to a good brushing consistency. Lightly coat both the foam core and the inside of the plywood envelope with the brushed on Hobbypoxy. Slip the core into the envelope and replace into the molds. Use plenty of weight, uniformly placed. Unlike contact cements, the Hobbypoxy will allow the core to align itself inside the plywood and will allow the plywood to assume the true contour of the core without any warps. Allow to cure thoroughly. Carefully remove the molds and keep them — you're not through with them yet.

Carefully razor saw the ailerons along the hinge line, cutting through the plywood and the balsa. Also, razor saw through the plywood and remove enough foam for the landing gear. Trim any excess plywood and sand the root edge flush with the root airfoil.

The two halves are now joined. To aid this, cut approximately 1" off of the root end of the molds and replace the wing panels into them. Weight them down again on the flat surface with the root sections in contact and carefully butt glue the panels together, using Hobbypoxy. (I wrap masking tape around the bottom of the joint to keep the Hobbypoxy in place.) If you have carefully followed the cutting and covering procedures, you now have a wing that is as close to perfect as is possible to produce. Notice how easily you have completed both the wash-out and the dihedral.

The wing can be completed in a conventional manner. A solid balsa trailing edge containing the aileron torque rods is added. The center section is strengthened all around with 6 ounce fiberglass to an 11" width.

The forward edge of the center section is built-up by adding false ribs to the nose of the airfoil at a width to match the fuselage and then filling between the false ribs with scrap balsa.

Stabilizer — The stabilizer is made almost exactly the same as the wing, with a few exceptions. Of course no dihedral and no wash-out is cut into the stab. The leading edge is too sharp to wrap the plywood around so the top and bottom are covered separately and a piece of balsa is placed on the leading edge and shaped after covering. The balsa hinge support is, in the case of the stab, a tip to tip spar that is glued to both halves of the stab before covering.

After the elevators are cut away, the required rudder clearance angle is cut and the raw foam edges of the elevators are covered with 1/16" balsa.

Fuselage — The major bulkheads, A, B, C, D, E, and F are flat on the bottom **at the same level** and provide the basis for the alignment of the fuselage. The longitudinal members key into the bulkheads and tie the structure together (see sketch of fuse. crutch). Lay out the fuselage plan on the flat surface and tape it down. The major bulkheads are stood up on the plan and the total crutch is built in place using a square to align each component precisely over its image on the plan. The aft crutch beams must be supported between bulkheads G and H by a 1½" gauge block throughout assembly. Bulkheads G and H are merely glued to and hang on the aft crutch, unsupported, until the sides and top are added.

I used Hot Stuff to assemble the crutch system and for much of the structural assembly after that. It was great! The fuselage side panels and the plywood doublers are added to the crutch. Since the forward section's side panels must be formed to a slight complex curvature at assembly, I like to "lay up" the doublers and sides simultaneously onto the crutch with epoxy and tape and/or clamp everything in place until the epoxy cures. This prevents the build-up of any stresses in the balsa sheeting caused by the compound bending of sides that have the doublers already installed. The side panels for the transition section and the wing saddle section require no bending on assembly, therefore may have their doublers installed before assembly to the crutch.

When all side panels are in place and all strengthening gussets, triangle corner braces, etc., are holding everything rigid, the stab and wing should be mated to the fuselage before the fuselage is moved from the flat surface.

Mounting The Stab — The two halves of the horizontal stabilizer should fit snugly against the fuselage side panels. Align the stabilizer to be accurately parallel to the flat surface, i.e., the chord **plane** of the stab, as measured on the leading edge, on the spar centerline, and on the tip airfoils, must be the **same distance** from the flat surface at all points.

Mating The Wing — The fuselage wing saddle must be mated to the wing, i.e., any sanding or fitting must be done to the saddle to fit the already fiberglassed wing center section. I found the carbon paper method to be most effective.

Tape a piece of carbon paper (carbon side out) to the bottom of the wing. Carefully place the wing in the saddle, as close to correct alignment as possible, and "wiggle" the wing a bit. The carbon marks on the saddle will indicate the high points that should be sanded. Work with great care and don't be in a hurry to take down too much wood at a time. It's awfully easy to go too far! The alignment measurements for the wing are as critical as for the horizontal stabilizer. A point on the tip should be the same distance from the flat surface as the corresponding point on the opposite tip. The 0-0 degree angle of attack of the root section must be maintained exactly. Notice that the 0-0 chord still shows on the tip airfoil — it must also be level with the flat surface.

When you are satisfied with the wing saddle, the wing hold-down bolt holes are drilled through the wing and tapped into the fuselage blocks. With the wing securely weighted in place, the dowel locations are back drilled into the wing leading edge through the holes in bulkhead "D".

A 1/16" plywood fairing is added to the trailing edge of the wing center section to complete the wing planform. Filleting of epoxy and micro-balloons to fair the top surface of the wing into the top of the fuselage is added after the fuselage top decking is in place.

The top decking can be added and the vertical fins can be fitted in place. The fins must be parallel and symmetrically placed relative to the aircraft centerline.

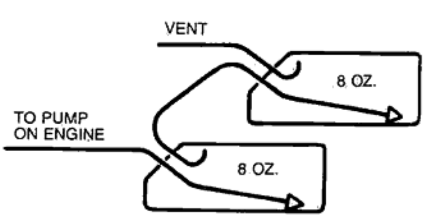
Engine and Landing Gear — The installation of the engine and retractable landing gear should offer no problem whatsoever to the experienced RC builder. The only difference is that the main gear must retract outward to maintain a reasonable wheels down geometry — different but no problem!

Some of the fitting-out of the Double Eagle is a little different from the usual and needs some explanation.

Fuel Tanks Hook-up — As was already discussed, the location of the fuel supply is critical to the maintenance of the CG of the Double Eagle. Also, the use of two 8 ounce tanks instead of a single 16 ounce tank helps to localize the fuel mass; also to maintain the critical CG location. A simple series hook-up of the tanks allows the use of the full 16 ounces as reliably as from a single tank.

DOUBLE EAGLE
Bill of Material

BALSA SHEET	
1/8 x 3 x 36	6 pieces
1/8 x 4 x 36	2 pieces
3/16 x 3 x 36	2 pieces
3/16 x 4 x 36	2 pieces
1/4 x 3 x 36	2 pieces
1/2 x 3 x 36	2 pieces
1/2 x 4 x 36	1 piece
5/8 x 3 x 24	1 piece
5/8 x 4 x 24	1 piece
BALSA SHAPES	
1/2 x 3/4 x 36	3 pieces
3/8 x 3/8 x 36	1 piece
3/8 triangle x 36	2 pieces
1/4 triangle x 36	1 piece
BALSA BLOCKS	
1½ x 1½ x 10	1 piece
1½ x 1 x 10	2 pieces
AIRCRAFT PLYWOOD	
1/4 x 6 x 12	1 piece
1/8 x 6 x 12	1 piece
1/16 x 6 x 12	1 piece
1/32 x 6 x 24	4 pieces
1/64 x 50 x 50	1 piece
POLYSTYRENE FOAM	
4 x 24 x 48	1 piece
HARDWOOD	
1/2 x 1 x 18	2 pieces
PIANO WIRE	
1/8 x 36	1 piece
5/32 (nose gear)	1 ea.
3/16 (main gear)	1 pr.
FIBERGLASS	
3/4 oz.	3 sq. yds.
Medium wt.	
Structural	1 piece 11 x 36
CANOPY	
"Wing Mfg." Sport style	1 ea.
SPINNER	
2¼ - inch	
CB Associates	1 ea.



To fill the tanks, break the line to the engine pump and fill until the vent line overflows and replace the line. There can be no other openings to the system or the series hook-up will not work.

Servo Hook-up — The servo mountings for the ailerons, throttle, and landing gear are conventional, so the builder shouldn't have any trouble.

The rudder and elevator are a little different. The prime consideration is centerline action to guarantee symmetrical movement of the control surfaces. The arrangement shown on the plan allows both of the elevator pushrods and both of the rudder pushrods to be symmetrical about the aircraft centerline.

The extreme rearward location of the rudder and elevator servos keeps the pushrods as short as possible (for stiffness) and helps to put the CG far enough rearward.

Finishing

After the construction is complete, the canopy is in place, and all crevices filled and filleted, the total aircraft should be fiberglassed with 3/4 ounce glass cloth and polyester resin. Don't forget the control surfaces. A couple of coats of thinned resin should be adequate to fill the glass cloth. (K & B's toilet paper procedure is highly recommended — Ed.)

The builder's favorite method of finishing an aircraft should be satisfactory but for weight saving and ease of excellent finish I use K & B Super Poxy, sprayed on. Two coats of Super Poxy primer, well sanded, provide the base for two coats of color. One coat of trim color and two coats of clear complete the finish. The Super Poxy cures to a wet-look shine that's hard to beat.

Pre-Flight

Carefully "zero" all control surfaces on the flat assembly surface.

Make certain that the CG location is in the range 40%-42% MAC **with the landing gear up.**

Make certain that the completed aircraft is in balance laterally. It should be able to sit level when placed on a 1/4" x 1/4" piece of wood placed longitudinally beneath the aircraft centerline. Add weight to the light wing tip if necessary.

Flying It

Taxiing out the Double Eagle for the first time is a real experience. On the take-off roll, you notice that the rudder control becomes very effective as soon as the Double Eagle starts moving. Don't over-control in yaw.

Recognize that there is a lot of mass forward of the wing to be lifted and don't try to lift it too quickly. Let it build up plenty of speed and then lift it gently. The landing gear placement and gear lengths shown on the plan gives a ground attitude that will allow the Double Eagle to build up plenty of speed without trying to leap into the air prematurely.

When you come in for your landing, don't come in as "hot" as you would with a conventional pattern aircraft. Make a couple of "check" passes to assure yourself that it's not going to "fall out" on you at slow speed then come on in. Keep a little power on, bring the nose up, and slow it down.

The first flights that I had with the prototype surprised me. When I rolled it over inverted, it was hell to get used to **not** pushing down elevator. Similarly in knife edge, the first time I rolled into one, I touched top rudder a little hard and she gained about 20' of altitude on me.

I also found some added benefits of Double Eagle's design: she snap rolls beautifully at reduced power with the application of elevator and rudder only. Similarly with spins, the entry is dead straight ahead and it will drop to either side with equal ease. Beautiful spins will result after a complete stall with elevator and rudder control only.

Modification For Piped Engines

Several designs of tuned pipes and engines designed for pipes are now available. Two piped modifications of the Double Eagle are now in the works.

For a side exhaust design, a radial mount is used to allow a rotation of the engine to an angle more convenient to the mounting of the pipe. To change to a radial mount, simply cut off the beam mounts at the forward surface of bulkhead "B" and attach a radial mount directly to the bulkhead.

For the rear exhaust engine, the design change is more radical. The beam mounts may be retained but a pipe covering fairing is substituted for the canopy. The engine exhaust is on centerline above the wing making a beautiful and very efficient installation.

Whichever mode of Double Eagle you decide to build, I'm sure it will fulfill your every expectation. It certainly has fulfilled mine! □

By H.E
RCModeler
May 1979.