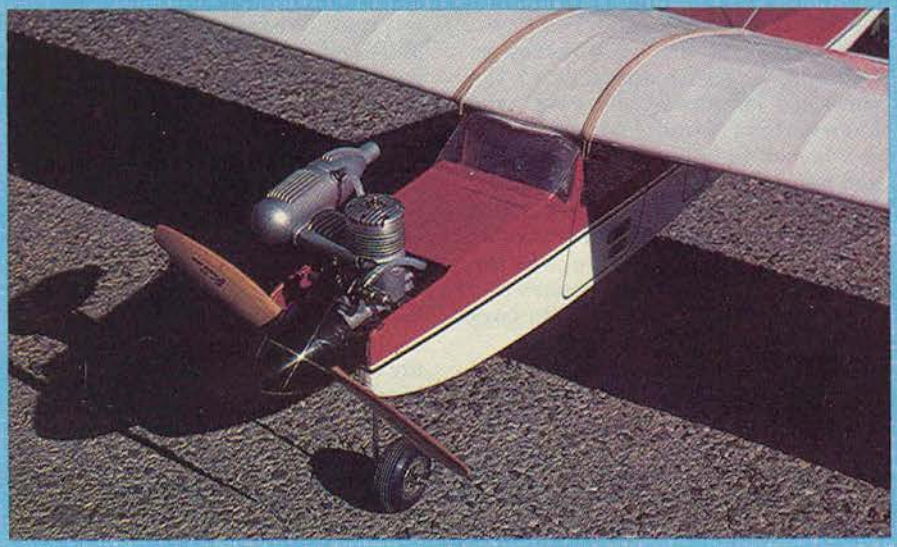
EAGLE 63

The growth and diversity of modeling is a never-ending, fascinating phenomenon. At first, practically all models were rubber powered free flights, and simple in structure. Then came control line which was an instant success and, much later, radio control. Improving the first crude radio equipment turned out to be a much more difficult situation, and many years passed before the technology advanced to the point where it could become a popular sport. Nowadays, a modeler can go all the way from tiny peanut models to giant scale jobs, from racing ships to sailplanes, and from sport ships to precision pattern models.

Along with this, so many people have been getting into modeling without a long apprenticeship, that there has been a real demand for simplification and prefabrication. The Eagle is intended to meet these criteria. Essentially, it's a conventional looking ship, with see-through cabin for appearance, extremely simple construction, and toughness created by considerable use of plywood and hardwood.

In spite of using these materials, the ship is surprisingly light, less than most balsa models of the same size. The lightness, combined with the high lift flat-bottom wing section, makes



EAGLE 63
Designed By: Carl Goldberg
TYPE AIRCRAFT
Trainer & Sport
WINGSPAN
62⅝ Inches
WING CHORD
11-9/16 Inches
TOTAL WING AREA
715 Sq. In.
WING LOCATION
High Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1¾ Inches
O.A. FUSELAGE LENGTH
45 Inches
RADIO COMPARTMENT AREA
3¼" x 11"
STABILIZER SPAN
23½ Inches
STABILIZER CHORD (incl. elev.)
7" Avg.

STABILIZER AREA
162 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
8⅜ Inches
VERTICAL FIN WIDTH (incl. rudder)
5-3/16" Avg.
REC. ENGINE SIZE
.29-.49
FUEL TANK SIZE
8-12 Oz.
LANDING GEAR
Tricycle
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail.
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Plywood
Wing	Hardwood, Balsa
Empennage	Balsa
Wt. Ready To Fly	**78 Oz.**
Wing Loading	**15.8 Oz./Sq. Ft.**

By Carl Goldberg

the ship capable of the slow flight a beginner needs to go along with his slow untrained reflexes. The Eagle has no trouble maintaining altitude at well under half throttle on a K & B .40, yet it can really go when the engine is opened up. It has been flown very successfully on an O.S. Max .20, as well as having been wrung out with a real good late model K & B .61 (we were trying to break the wing with dives and sharp pull-ups). The HB 40 PDP has also given excellent results.

Overall, besides being an easy to fly trainer, the Eagle makes a very good sport ship — quick to build, tough enough to stand up to the rigors of lots of flying, and very maneuverable. It has been flown with three different dihedrals — low dihedral for the advanced sport flier, medium dihedral for the average modeler, and high dihedral for three channel equipment. Slow dihedral, of course, is best for inverted flight and certain maneuvers such as stall turns. Most people undoubtedly will fly it with four channels, but it does fine as a three channel bird, too. The equipment we've used has been Futaba and Kraft, and the final model has Airtronics' equipment. All of it has done well. Most of the flying has been done with the K & B .40 and an 8 ounce Sullivan tank. It takes a 10 ounce tank easily and even a 12 ounce tank with very little difficulty. An outstanding feature has been that it's not particularly sensitive to the C.G. location. We moved the C.G. back and forth, and anywhere near balancing on the main spar works out well.

All of the prototypes were built completely with Super Jet. It does such a good job on plywood, hardwood, and balsa wood, it makes building a model much easier. We sure wouldn't want to go back to any of the older glues. One caution here — **do not use any of the watery thin** cyanoacrylates such as regular Jet, Hot Stuff, etc.; they are simply not intended for models of this type. You can use epoxy, or aliphatic resin glues, but it will slow the building down considerably.

THE EAGLE 63 IS:

★ Good Looking

★ Gentle to Fly

★ Easy to Build

★ Economical

The Eagle will soon be available as a kit, but with the RCM plans, you can scratch-build your own. Some of the parts will be slightly different from the photos because of design improvements. By the way, one of our prototypes used 1/8" balsa sides, but with a 1/16" plywood doubler in the forward areas. If you use balsa sides, be sure to brace the cabin center posts with some vertical grain material.

CONSTRUCTION

Wing:

1. ☐ Cut out rectangular strips for each rib drawing. Using rubber cement or similar, glue the strips to 3/32" balsa, and cut out pairs of all ribs except where you need more than two.

2. ☐ Notch trailing edges (T.E.) according to spacing shown on the plan.

3. ☐ Pin right wing T.E. in place on the plan, then the bottom spar.

☐ Tack-cement aileron to T.E.

☐ Using no glue, place the following four ribs in their respective T.E. notches: ribs #2, #3, #4, and #4, hooking them over the spar as you go. Place some rib wood scrap under rib #2 as a shim.

☐ Glue ribs #3, #4, and #4 to T.E. and spar. **Do not glue ribs #2 at this time.**

4. ☐ Position leading edge (L.E.) dowel in place over the plan. Press it into rib recesses, holding it tight with angled pins as you go.

☐ Do not glue #2 at this time. Glue ribs #3, #4, and #4 to L.E.

5. ☐ Pin end of L.E. and spar in place as shown. Remove rib #2 and scrap shims.

☐ Slide sheet B forward until it just touches the L.E. and align it with the end of L.E. (Note wood grain direction.) Mark spar location on both edges of sheet with your knife. Use metal straightedge to trim off excess material.

☐ Cut sheeting to fit between spar and T.E.

☐ Glue rear sheeting halves together, then glue all sheeting to L.E., spar, and T.E.

6. ☐ Position and glue two ribs #2 to L.E., bottom sheeting, spar, and T.E.

7. ☐ Glue rib #4 in place at wing tip, gluing to spar and T.E. only.

☐ Working one at a time, glue remaining ribs #3 and #4 in place. Glue to **spar and T.E. only.**

8. ☐ Spar "set-back gauges" can be used to set back top spar to minimize sanding. Choose proper gauge to suit your dihedral, and position it touching bottom spar. Touch end of top spar to gauge, and set spar in rib slots.

☐ Glue top spar to all ribs.

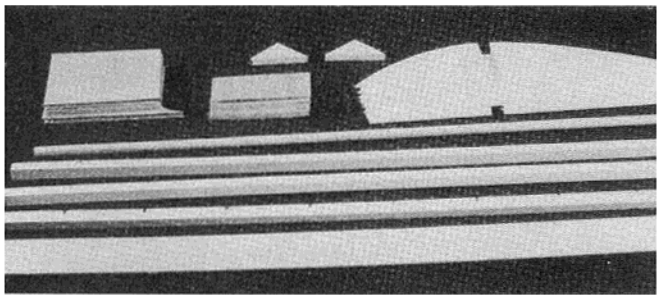
☐ Glue wing tip gussets to L.E. and T.E.

EAGLE 63 MATERIALS LIST

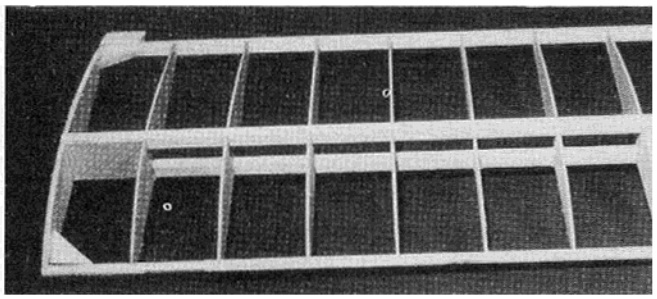
3/32" x 3" x 36" med. balsa, 7 req'd. — wing ribs, shear webs.
3/32" x 4" x 36" med. balsa, 1 req'd. — wing sheeting.
1/4" x 3" x 36" med.-med. hard balsa, 1 req'd. — tail parts.
1/8" x 12" x 48" lite ply, 1 req'd. — fuselage sides.
1/8" x 12" x 24" lite ply, 1 req'd. — fuselage top & bottom, etc.
1/8" x 6" x 12" birch ply, 1 req'd. — wing joiners, braces, servo rails.
1/4" x 6" x 12" birch ply, 1 req'd. — firewall, breakaway plate.
5/16" x 1¼" x 36" tapered trailing edges, 2 req'd. — ailerons.
3/8" x 1/2" x 36" med. balsa, 2 req'd. — wing trailing edges.
3/8" x 3/8" x 36" bass or spruce, 4 req'd. — wing spars, hatch supports.
5/16" dia. x 36" dowels, 2 req'd. — leading edges, hold-down dowels.
1/8" x 1/4" x 36" med. hard balsa, 3 req'd. — tail trussing.
3/8" x 1/2" x 12" birch, 1 req'd. — engine bearers.
5/16" x 5/16" x 24" med. hard balsa, 2 req'd. — pushrods

Accessories:

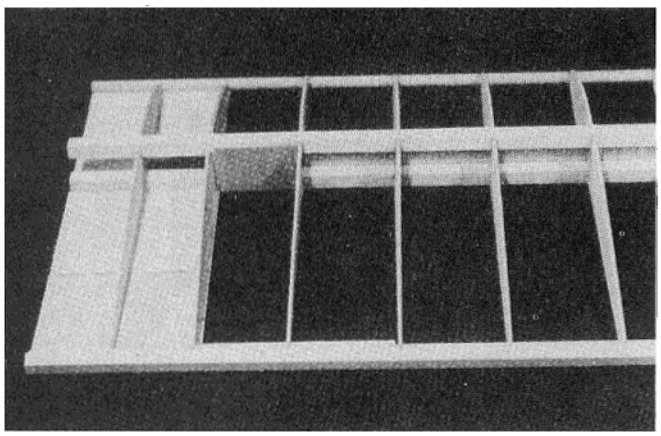
Long control horn, CG #CH-1, 1 req'd.
Short control horn, CG #CH-2, 1 req'd.
4-40 x 1/2" socket head screws & washers, CG #SH-404, 4 ea. req'd. — engine mounting.
4-40 x 3/4" socket head screws & washers, CG #SH-406, 4 ea. req'd. — breakaway mounting.
4-40 x 1/2" pan head mach. screws, nuts & washers, 4 ea. req'd. — nosegear bearing.
3/32" strip aileron horn set, CG #SAH-332, 1 set req'd. — ailerons.
True 1/16" pushrods, CG #AP-1, 1 bag of 2 req'd. — ailerons.
Nylon Snap-Links & rods, CG #SL-1, 3 req'd. — horn connections, throttle.
1/16" dia. x 36" music wire, 2 req'd. — nosegear steering, throttle, etc.
Williams Bros. 1½" scale civilian pilot, 1 req'd. — for realism.
1½" x 1½" x 12" soft balsa, 2 req'd. — wing tips.
.030" x 8½" x 17" clear plastic, 1 req'd. — windshield and windows.
2½" x 2½ ft. nylon fabric, CG #N2 — wing center wrapping.
.006" x 1" x 3" half-hard aluminum from beverage can, 2 req'd. — trailing edge reinforcement.
Angle hold-down, CG #AH-1, 1 bag req'd. — hatch.
Pushrod connectors, CG #PC-1, 6 pcs. req'd. — servo connections.
5/32" nosegear strut w/adjustable axle, CG #NSA-532, 1 req'd. — nosegear.
4-40 blind nuts, CG #BN4, 8 req'd.
5/32" steel wheel collars, CG #WC532, 6 pcs. req'd. — wheel retention.
5/32" music wire for main gear struts, 28" req'd. — landing gear.
1/16" threaded coupler, CG #TC116, 1 req'd. — throttle pushrod.
Klett pinned hinges, regular size, 1 bag req'd. — control surfaces.
Fuel line, 1 foot req'd.
Fuel tank, 1 req'd.
Propeller to suit engine — for .40, use 10/6.
2¼" spinner, CG #S225BK, 1 req'd.
Foam rubber 1/2" x 6" x 12", 1 req'd. — radio protection.
Wing seating tape, 1/16" x 1/4" x 36", 1 req'd. — wing cabin sealing.



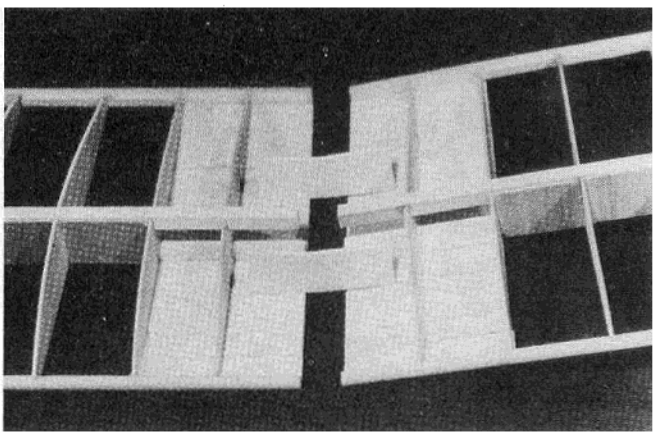
Cut a complete set of parts for wing before starting assembly. L.E. is 5/16" hardwood dowel.



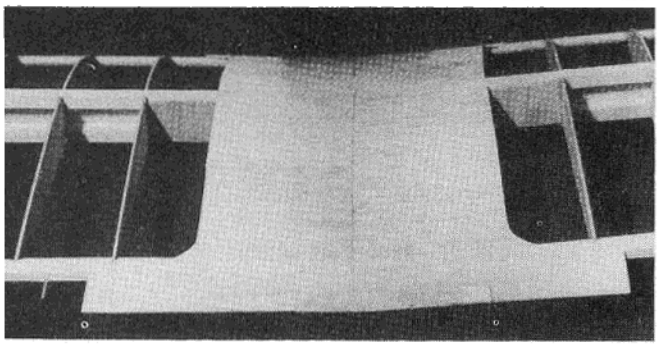
Right wing panel completed with tip gussets and outer T.E. piece glued in place.



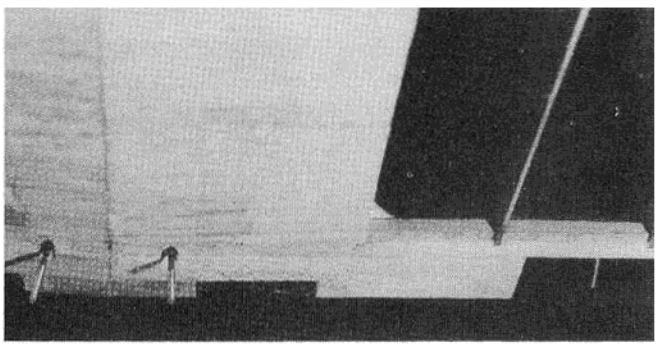
Right panel shown at center section ready to be joined to left panel.



Joining wing at center section (step 15). Handy ply clamps are used for this operation.



Joined wing panels. Note aluminum T.E. strip installed and 2½" nylon fabric wrapped around center joint.



Bottom of wing center section showing aileron horn wires installed.

9. ☐ Working a few ribs at a time, apply Super Jet to glue loose ribs to L.E. Gently squeeze L.E. into ribs and hold until set. Repeat until all ribs are glued to L.E.

10. ☐ Glue shear webs to spars at locations shown on the plan.

11. ☐ Repeat steps 3 through 10 for left wing.

12. ☐ With left wing still pinned down, position right wing in place next to it. Raise right wing tip, and support it with blocks or books at the height you have selected for dihedral.

13. ☐ Study center joints and, if necessary, slightly sand protruding parts for better fit.

☐ Be sure right wing is held firmly against left wing, and pin in place.

14. ☐ Apply a liberal bead of Super Jet to the joints of L.E., spars, sheeting, and T.E.

15. ☐ Apply two beads of Super Jet to one side of both dihedral joiners, near top and bottom. Position one end of joiner in place and swing the other end up against the spars — hold momentarily. Repeat for other joiner — immediately install plywood clamps to hold both joiners tight on the spars.

16. ☐ Position front and rear halves of one rib #1 so one side aligns with the center of the wing. Adjust rib to align with spar center joint, T.E., bottom sheeting, and L.E. joints. Glue in place.

☐ Glue remaining halves of second #1 rib to first rib, making double thickness center rib at center joint.

☐ Be sure to glue any joints of the wing that still need glue.

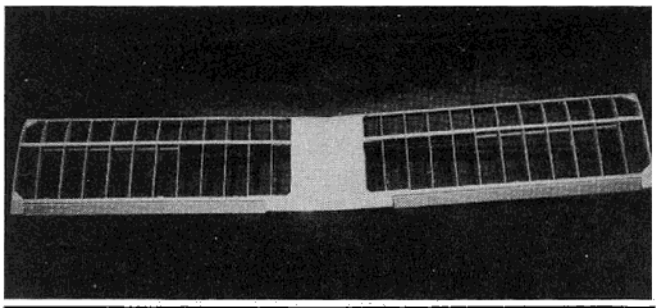
17. ☐ Remove all clamps, gauges, and pins from the wing structure.

☐ Glue top sheeting in place, trimming to fit as required.

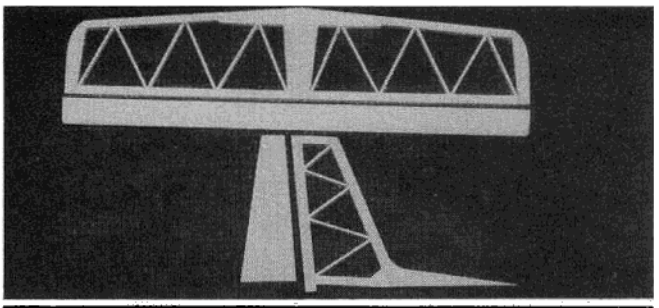
☐ Turn wing upside down, and glue any joints still needing glue.

18. ☐ Slide nylon tubing onto 3/32" strip aileron horn wires.

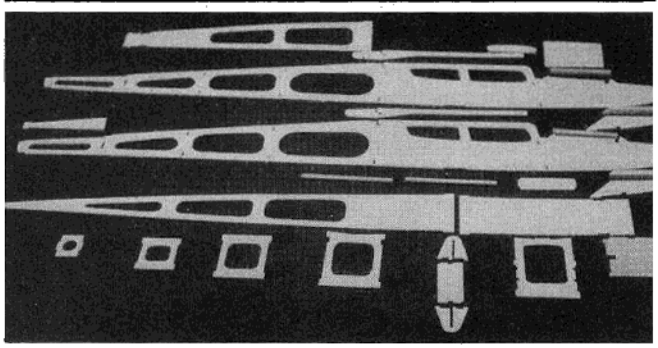
☐ Make one **left** and one **right** aileron horn by bending unthreaded



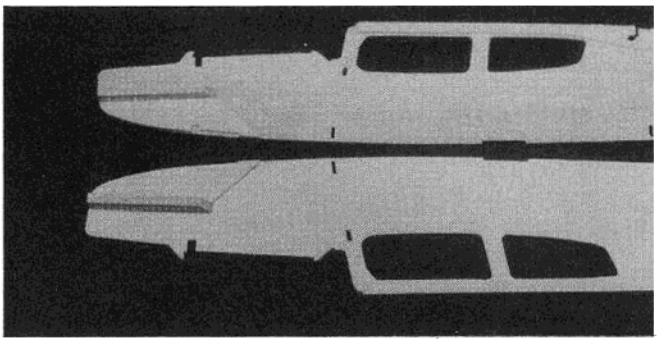
Completed wing construction with tips still to be added.



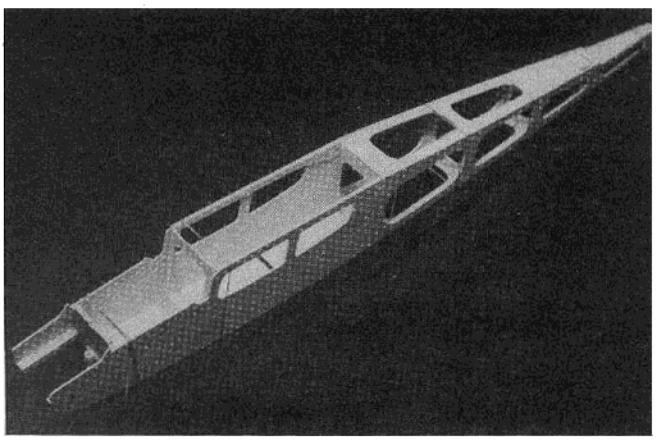
Completed tail group. Slot has to be cut in stab to accept fin post.



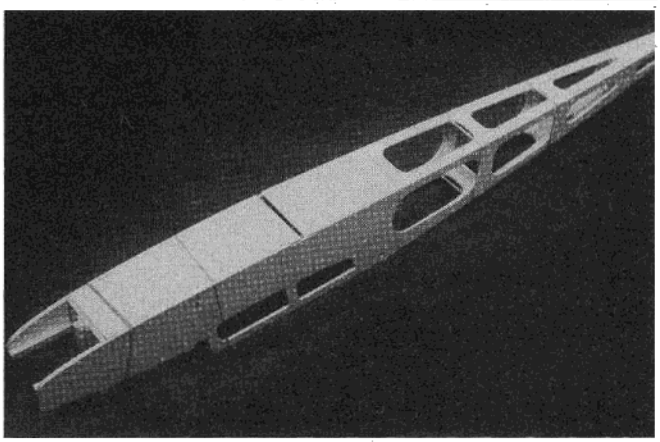
Best to cut complete parts kit for fuselage before starting assembly.



Fuselage sides with nose doublers, bearers and cabin top doublers glued in place. Fuselage side template has outline for proper location of nose doubler.



As outlined in Step 7 of fuselage assembly, sides, formers, top and bottom are now glued.



Bottom view of assembled fuselage. Note gap for landing gear to slip into.

end of wire 90 degrees at end of nylon tubing as shown. Wires should rotate easily in tubes; binding between wire bend and tubing may be relieved by shortening tubing slightly. Observe offset angles for differential action.

19. ☐ Carefully remove aileron from T.E. Mark center line along entire lengths of T.E. and aileron. Photo shows this being done with C.G. Center Line Marker.

☐ Mark each T.E. 7" from center joint.

☐ Mark **front** of ailerons 7", and **bottom** of ailerons 6" from inner ends.

20. ☐ Wrap sandpaper around a square cornered block to make "V" grooves 7" long by 1/16" deep in T.E. and ailerons on both wing halves.

☐ Using threaded end of an aileron horn, file grooves to a rounded shape so half of the nylon tubing will lie recessed in both the aileron and T.E.

21. ☐ Carefully cut the ailerons at 6" marks. Save short pieces for T.E. inboard sections.

☐ Using threaded end of aileron horn as a file, make clearance slots 3/8" from center joint in wing T.E., and 3/8" from inner ends of T.E. inboard sections.

☐ Temporarily place horn in wing grooves, position both T.E. inboard sections, and check for horn movement — top to move about 3/4" total fore and aft.

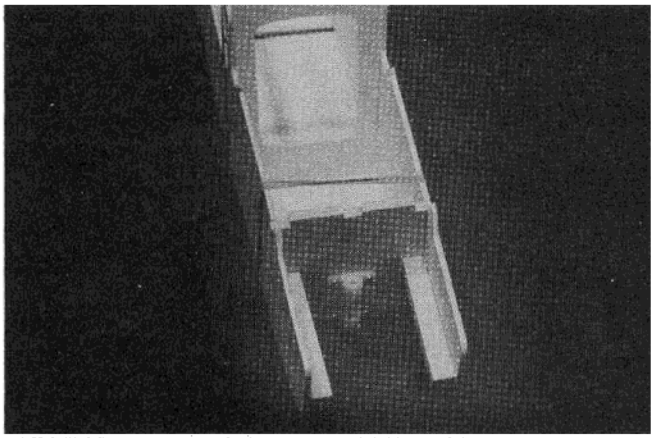
☐ Carefully glue tubing and T.E. inboard sections in place.

22. ☐ Cut 1¼" off wing tip end of ailerons, and glue to T.E., flush with outer end of T.E.

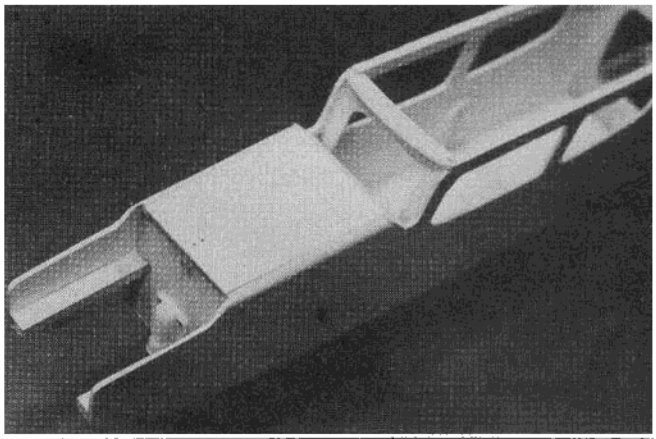
23. ☐ Pin the balsa pushrod to the underside of the aileron flush with rear edge.

☐ Sand bevel up to the center line of the aileron with square-cornered sanding block on table. Turn the aileron over and repeat.

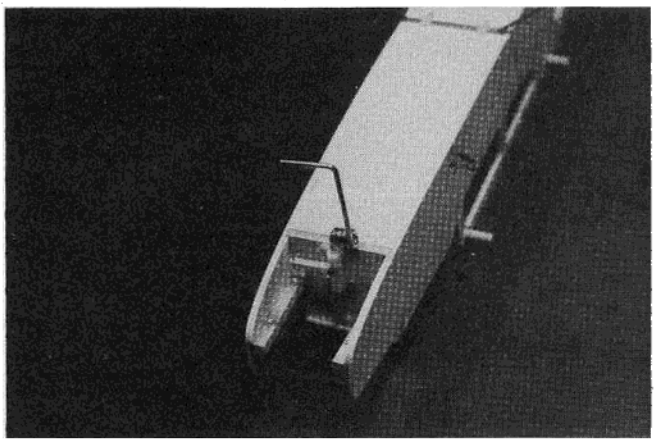
24. ☐ Holding threaded end of one aileron horn nearly straight up, slowly press the aileron on the other end of the wire to make a mark. With a

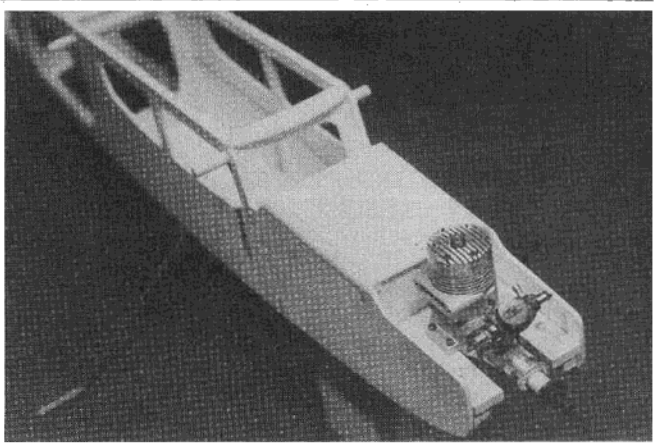


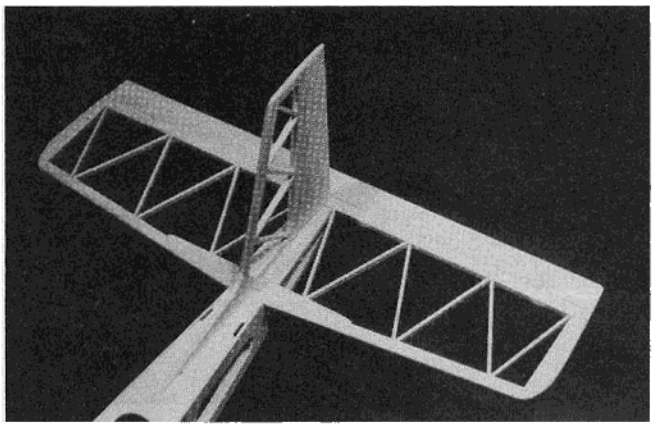
ABOVE: Notch in center of firewall is for hatch hold-down nylon bracket (CG #AH-1). Outer notches are for bass hatch supports. Bottom view showing nose gear installation. Blind nuts secure ply engine mounting plate.



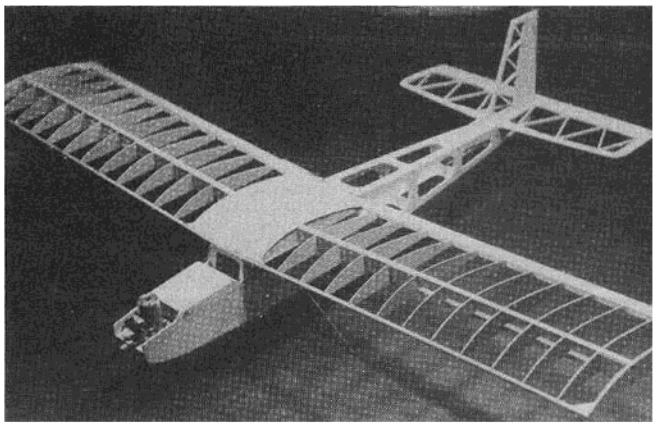
ABOVE: Hatch installed and front end ready for engine installation. BELOW: K & B .40 installed in nose. Eagle 63 has been flown with an O.S. Max .20 and up to a K & B .61.







Tail group has been carefully fitted to fuselage and is not glued in place until after covering is completed.



Completed Eagle framework still minus wing tip blocks. Builds into a very strong model.

small nail, make a hole for the wire. Repeat for other aileron.

☐ Place T.E. and aileron on plan, and mark hinge locations.

☐ Preferably using a hinge slotting kit, cut hinge slots. Temporarily install hinges and test fit ailerons. The gap between T.E. and the aileron should not exceed 1/32". Hinges are permanently installed after covering.

25. ☐ Using 240 grit (fine) sandpaper, flat sand entire wing to blend surfaces and remove high spots.

☐ Cut half-hard aluminum sheet from pop or beer can into two 1" x 3" pieces, and lightly sand aluminum surfaces for better gluing. Apply a bead of Super Jet to half of a 3" sheet, and glue it to the wing T.E. as shown. When dry, apply glue to other half and then wrap it around T.E. Repeat for other 3" piece.

26. ☐ Apply a dab of Super Jet at center joint on the wing bottom, and stick one end of 2½" wide nylon to it. Let dry a few seconds until the nylon is **glued solid** to the balsa.

☐ Apply a squiggle of glue to wing center, and pull nylon fabric into it. Rub nylon into glue with your finger (cover finger with plastic bag or similar).

☐ Repeat gluing procedure and apply nylon around L.E., across top of wing, around T.E., and finally overlapping where you started on the wing bottom.

☐ After entire center joint has

sides, making sure to flush parts as shown.

☐ Glue bearers solidly to the sides, and edge of nose doublers.

☐ Glue cabin top doublers in place.

Important: In the following steps, do not use glue until called for. Hold parts using rubberbands and masking tape.

6. ☐ Plug formers B and F into the slots in the body sides.

☐ Install remaining formers A, C, D, and E in the same manner.

☐ Temporarily install wing dowels. Formers B and C should rest against them.

☐ Insert top sheet under rubberband at former C, and work it towards the tail, slipping it under bands as you go.

☐ Lock tabs at both ends of the top sheet into corresponding notches in the fuselage sides.

☐ Position the stab platform in place between the tail end and former F.

☐ Position the front and rear bottom sheets in the same manner.

7. ☐ Place the fuselage over **top view** on plan and carefully align the fuselage to match the plan outline.

☐ When satisfied with alignment, permanently glue the sides, formers, and sheet parts in place. Apply a bead of Super Jet along all joints (inside and outside) — it will penetrate the joint and leave a slight reinforcing fillet.

8. ☐ Glue the windshield top former and dashboard solidly in place.

9. ☐ Tape the hatch cover and dashboard top together.

☐ Tape the hatch supports to both sides.

☐ Position the taped parts in place on the fuselage. **Glue only** the hatch supports to the body sides.

☐ Remove the hatch cover from the fuselage and glue the 1/8" ply tongue in place on the bottom of the hatch cover.

☐ Glue the dashboard top to the hatch supports and dashboard.

10. ☐ Place the landing gear (L.G.) mount on the inside bottom of the fuselage. The cutouts at each end of the mount **must** be positioned evenly over the slot in the fuselage bottom. Glue the mount in place.

☐ The L.G. braces interlock with the L.G. mount. Glue the braces solidly to the fuselage sides and L.G. mount.

Engine Installation and Fuselage Completion:

1. ☐ Mount the propeller and spinner on your engine.

☐ Tape breakaway plate on the engine bearers. Note cut-out is on an angle for right thrust.

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☐ Install switch and charging jack cover plates on the fuselage side opposite to the engine exhaust. Mark through the cover plates for holes and openings.

☐ Make holes through the fuselage sides, then install the switch and jack.

☐ All pushrods should be checked to see that they move freely without binding; adjust if required for smooth operation.

☐ With trim tabs on the transmitter centered, check to see that the rudder aligns perfectly with the fin, elevator top is flat with the top of the stab, and that the nosewheel points straight ahead. Adjust Mini-snaps as necessary. Also make sure that the surfaces move in correct direction when the transmitter sticks are operated.

☐ Measure the aileron movement with full stick deflection right and left. Total movement should be approximately 5/8".

☐ Check engine, and adjust needle valves for dependable idle and smooth high speed.

5. ☐ Flying the model is simple, as befits a sport and trainer model. Take-offs require a touch of back-stick (more off of grass), and turns are made with either ailerons or rudder. For landings, the light weight and high lift airfoil tend to make the ship land farther down the runway than one might anticipate. After the first landing or two, adjust the rudder and elevator by means of clevises, according to indications of the trim tabs.

I will appreciate hearing from you with any comments or suggestions. Best of luck! And have fun — that's what the hobby is all about!

☐

From RCModeler Feb. 1982

☐ Try your engine on breakaway, and make any necessary adjustments.

☐ Maintain approximately 1/8" clearance between the spinner backplate and fuselage front.

☐ Temporarily set the engine in place by taping, tying, or tack gluing with Super Jet, and measure for right thrust. Left side distance should be approximately 1/4" longer than right side.

☐ Mark through the mounting holes onto breakaway plate.

☐ Remove the engine and breakaway plate. Drill four 1/8" screw holes through breakaway. Use scrap ply under parts when drilling to avoid splintering.

☐ Use four socket head screws and washers to draw the blind nuts up into place on underside of breakaway.

☐ Using the plan as a guide, measure and mark hole locations for holding breakaway onto bearers.

☐ Tape breakaway in position on the fuselage. Drill a 1/8" hole through breakaway and engine bearer. Insert a #4 x 3/4" pan head screw in the hole.

☐ Continue this procedure, one hole and screw at a time, until all four screws are in place.

☐ Using screws and washers, draw the blind nuts up into the bottom of the engine bearers.

2. ☐ Refer to the main plan for suggested location, and drill two 3/16" diameter holes for the fuel lines through the firewall.

☐ For throttle pushrod, drill a 1/8" diameter hole through the firewall as indicated on the plan. **Be sure** the hole is on the same side as your engine throttle.

☐ Temporarily install the nosegear strut and steering arm in the nosegear bearing. Swing the steering arm over to the side opposite to the throttle pushrod hole. Drill a 1/8" hole through the firewall for the steering pushrod, directly behind the outermost hole in the steering arm and about 1/8" above it.

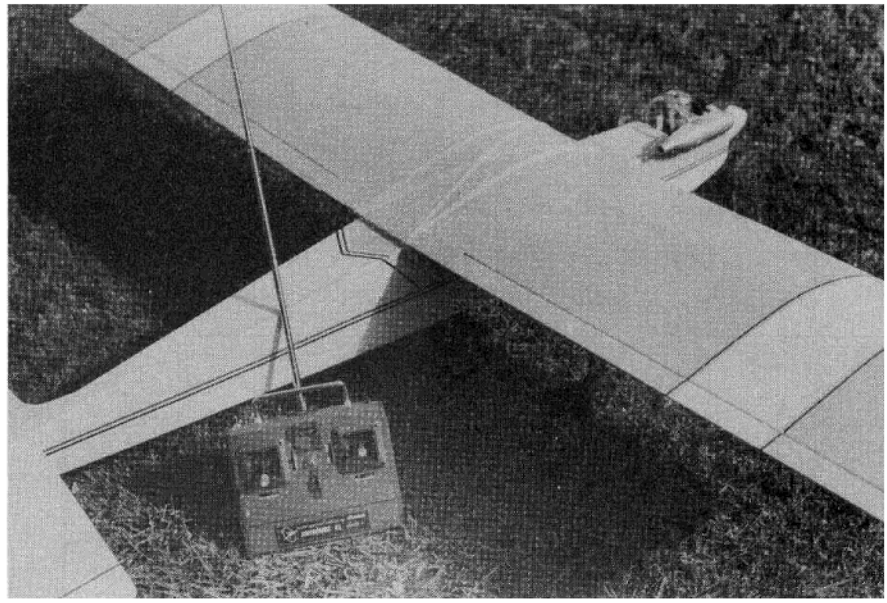
☐ Remove breakaway, steering arm, and nosegear strut from the fuselage.

3. ☐ Secure hold-down to hatch with two #2 x 3/16" wood or sheet metal screws.

☐ Set the hatch in position on the fuselage. Mark for screw location and install the screw exposing enough unthreaded shank to engage hold-down.

4. ☐ Temporarily install wing hold-down dowels in the fuselage. Rubberband wing in place, **making sure it is centered.** Viewing model from rear, see if the stab sets level with respect to the wing.

☐ Sand the stab platform as may be necessary to provide a good level fit for the stab. Do not alter the angle of the fuselage sides.



☐ Center stab on the fuselage using a tape measure to obtain equal distance from side to side, and from the fuselage nose to rear corner of each stab tip. Pin in place.

☐ Trial fit fin in place. Glue dorsal fin to main fin, but not to fuselage. Finish sanding, then remove tail assembly.

5. ☐ Flat sand the fuselage and round off the corners, except for the top of the cabin, top of tail mounting area, and window openings. In these areas, sand only very lightly to remove burrs.

☐ Lightly sand the window frame area for good bond of windows to fuselage. Permanently glue the side windows in place, being careful to avoid smearing glue on the windows.

☐ Trial fit the windshield until you are able to tape it in place. Then start adhering it wherever possible, finally removing the tape, and gluing in those areas.

☐ Insert wing hold-down dowels through the cabin with a twisting motion, and glue in place.

☐ Using fuelproof paint, seal exposed ends of the dowels and any other unprotected wood surfaces.

6. ☐ Fuelproof the engine and tank areas, using either polyurethane enamel, Super Jet, or epoxy. Polyurethane is available in colors, so you can match your color scheme.

☐ Apply fuelproofer to entire engine area and breakaway, inside tank compartment, and bottom of hatch cover. Open up the screw holes with a toothpick while the paint is wet. Let dry thoroughly.

☐ Make up two balsa pushrods per the plan and sketch.

Covering:

1. ☐ A good covering job should be preceded by careful sanding, filling nicks and dents, then more sanding. Use a filler appropriate for balsa. For final sanding, use fine sandpaper (grade 240 to 320) and a sandpaper block.

☐ Our prototypes were covered with Super MonoKote. The bottom of each flying surface was covered first, then the top. In the case of the fuselage, the bottom was covered first, then the sides and, finally, the top.

2. ☐ Truing the wing is an **important step** and should not be rushed or omitted.

☐ Set one half of the wing on a flat surface to detect warp. To counter any warp found, twist panel slightly in direction opposite to the warp, and hold position while gliding an iron over the MonoKote to retension structure. Repeat process until the panel is true.

☐ Follow the same procedure with the other half of the wing.

☐ After covering the tail members, they should be checked for warps also.

3. ☐ To increase effectiveness and reduce the chance of flutter, keep all control surface gaps no wider than 1/32".

☐ To fasten hinges permanently in place, apply a squiggle of Super Jet to the hinge slot, and to both sides at one end of the hinge. Carefully position and insert the hinge, and wipe off squeezed-off glue immediately.

☐ Insert hinges first into main surface. Then insert just the end of the hinges into the control surface. Apply Super Jet where the hinges start into the control surface, then in one smooth motion carefully bring the control surface all the way into place. Use a paper towel to blot squeezed-out glue from the hinges.

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