



NEW ERA III (REVISITED)

By Joe Beshan

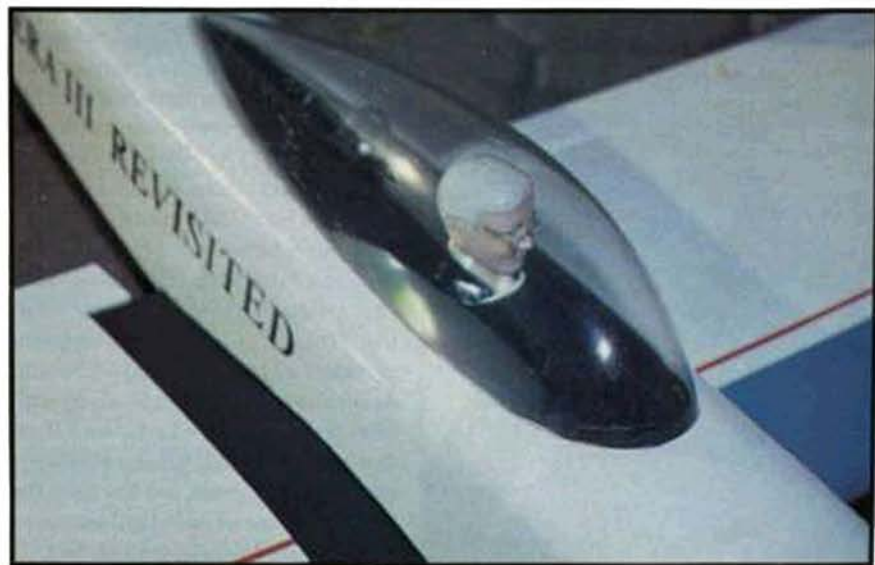
A Great Performing Classic "Updated"

"New Era III Revisited," an interesting story, I hope, from whence it came. Initially, as a member of the 10-70 Repeater organization, an amateur radio operators club, a member approached me, knowing of my interest in R/C modeling, and offered a partially completed R/C model which he said he had started a long time ago, and was sitting in the rafters of his home. He further explained that he was about to throw it out and, if interested, he would be happy to give it to me. At first I said I wasn't interested, as I like to build my own models. When he told me the address where it was located, which, coincidentally, is on the way to our flying field, I thought I would pick it up and give it to one of my modeling friends to complete.

Accordingly, I picked up the model, which was bare bones and partially complete. I didn't recognize it as a model I was familiar with and took it to the field. I asked if anybody wanted it and, by golly, there wasn't any interest; so I threw it in the trunk of my car, brought it home, and let it sit in my garage. Sometime thereafter, I came across it and debated whether I should scrap it. A closer look cultivated my interest; I did have a .25 engine which I could use for

power. I visualized its development for completion and realized I probably could add enough to complete it. It was a challenge — the more I observed it, the more interested I became, to the point where I decided to go ahead and complete it, which I succeeded in doing.

At this point, I still didn't know what the airplane was and, subsequently, took it to our club meeting and the flying field and asked around if anybody could recognize it, but without success. I proceeded to preflight, check it out, and flew it. I was absolutely amazed at the performance of





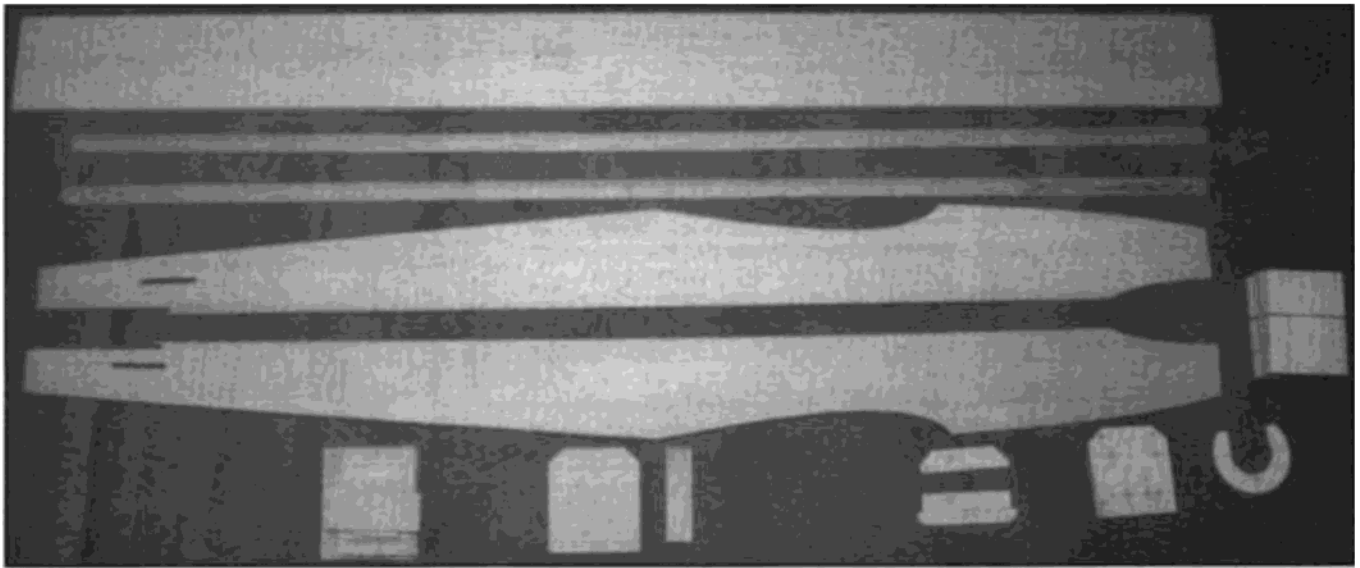
ABOUT THE AUTHOR

Joe has been a model builder since 1936, and has been actively competing in model events since 1938. Over the years, he has competed in free-flight, indoor, R/C, and old-timer activities. He has had more than twenty-two articles published over the years, including two construction articles in *RCM*. (The Fox #1004 and the Yellow Electrician #1082.) During WWII he was a B-17 pilot flying in the European Theater. Joe has served as an AMA V.P. (Dist. II), held various club positions, was the organizer of the Vintage R/C Society, and is a member of the Academy of Model Aeronautics Hall of Fame, along with numerous other awards. And if all that wasn't enough to keep him busy, for the past 32 years, Joe has been the Vice President of Hydrotherm Corporation where he is employed.

NEW ERA III (Revisited)	
Designed by:	
Don Dewey (Updated by: Joe Beshar)	
TYPE AIRCRAFT	
Sport/Pattern	
WINGSPAN	
44-1/2 Inches	
WING CHORD	
9-1/8 Inches	
TOTAL WING AREA	
400 Sq. In.	
WING LOCATION	
Low Wing	
AIRFOIL	
NACA 2412 Modified	
WING PLANFORM	
Constant Chord	
DIHEDRAL, EACH TIP	
1/2 Inch	
OVERALL FUSELAGE LENGTH	
39 Inches	
RADIO COMPARTMENT SIZE	
(L) 8-1/8" (W) 2-1/2" (H) 3"	
STABILIZER SPAN	
19 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	
5-1/2 Inches	
VERTICAL FIN WIDTH (inc. rud.)	
5-1/2 Inches (Avg.)	
REC. ENGINE SIZE	
.18-25 2-Stroke	
FUEL TANK SIZE	
4 Oz.	
LANDING GEAR	
Conventional	
REC. NO. OF CHANNELS	
4	
CONTROL FUNCTIONS	
Rud., Elev., Throt., Ail.	
C.G. (from L.E.)	
2-3/4 Inches	
ELEVATOR THROWS	
1/2" Up — 1/2" Down	
AILERON THROWS	
5/16" Up — 5/16" Down	
RUDDER THROWS	
3/4" Left — 3/4" Right	
SIDETHRUST	
2-1/2 Degrees (Right)	
DOWNTHRUST/UPTHRUST	
0	
BASIC MATERIALS USED IN CONSTRUCTION	
Fuselage	Balsa & Ply
Wing	Balsa & Ply
Empennage	Balsa
Wt. Ready To Fly	48 to 56 Oz.
	(4 to 4 Lbs., 8 Oz.)
Wing Loading	18-20 Oz./Sq. Ft.

the model. I found that it grooved and penetrated perfectly; it went exactly where you pointed it and did each and every maneuver that you called upon it to do, from sustained knife-edge flight to vertical maneuvers of any type.

Yet, it would slow down and drag in nose-high at a landing rate so slow that it was hard to believe that it was still airborne. I recognized it to be equivalent to any .60 powered pattern aircraft. I let some of the



Fuselage parts prior to assembly.

proficient fliers at the field fly it, and they agreed that the performance was outstanding and comparable to .60 performance. I kept searching for somebody who would recognize the model, and finally, who else but my electric flying friend, Ben Bendit, recognized it as "The New Era III" and remembered it was published in RCM and kitted by Airtronics, Inc. I flew it, flew it, and flew it, and finally one day, coming in on approach, believe it or not, one of the ailerons fell off due to failure of the hinges. The model impacted into the ground for a total loss. Overly impressed with the model, I decided that I was going to build a new unit from scratch.

I found that Don Dewey, the founder of RCM, was the original designer of the New Era III, and that Lee Renaud developed the construction details and later kitted it at Airtronics, Inc., and no other than Dick Kidd drew up the plans. (Others such as Chuck Cunningham, Bill O'Brien, and Carl Mass made contributions.) Originally, New Era III was published in 1975, a period where I was involved in the Old-Timer movement; in fact, serving as President of the Society of Antique Modelers (SAM). As I think back, Don Dewey was also very helpful in the growth of SAM; when I contacted him during that period and asked whether SAM could get a column in the magazine he very generously donated a page monthly which

helped promote the R/C Assist Movement in Old-Timer activity, contributing to its very predominant and important part of the SAM organization. I recall, he built and was flying a Scientific Mercury. Don could always be depended on.

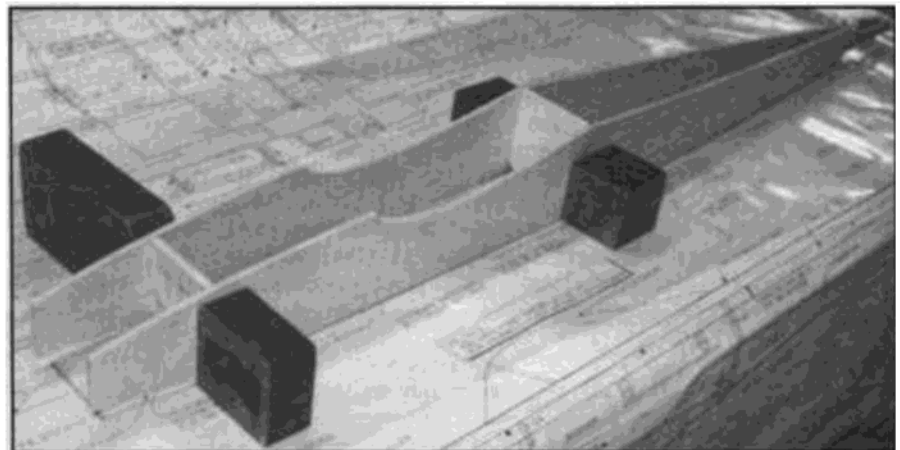
All and all, these memories have been very joyful for me, and I trust that you will build the "New Era III Revisited" and find it as enjoyable to build and fly as I have.

I proceeded to check with RCM for further details and found, of course, that Dick Kidd was familiar with the New Era III, as he originally drew the plans for the model. He also advised that the

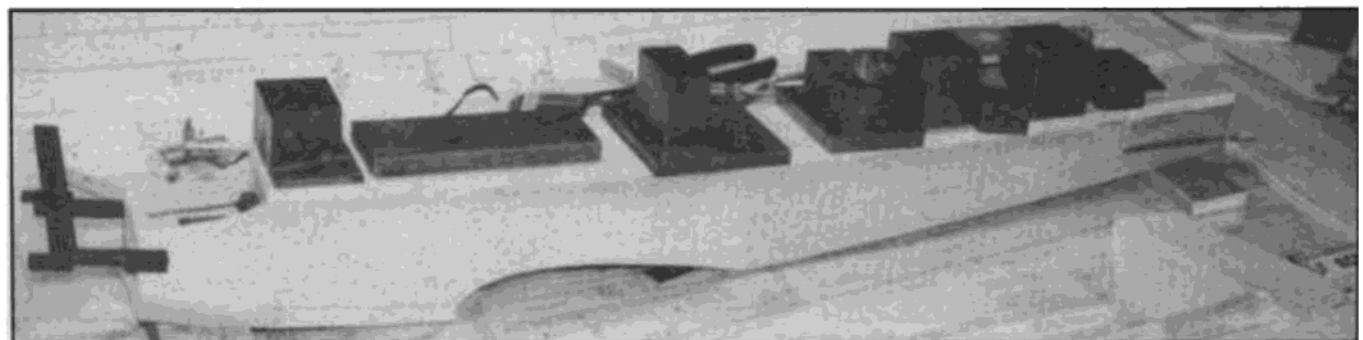
plans were still available at RCM and sent me a copy.

Some of the "Besharizing" follows:

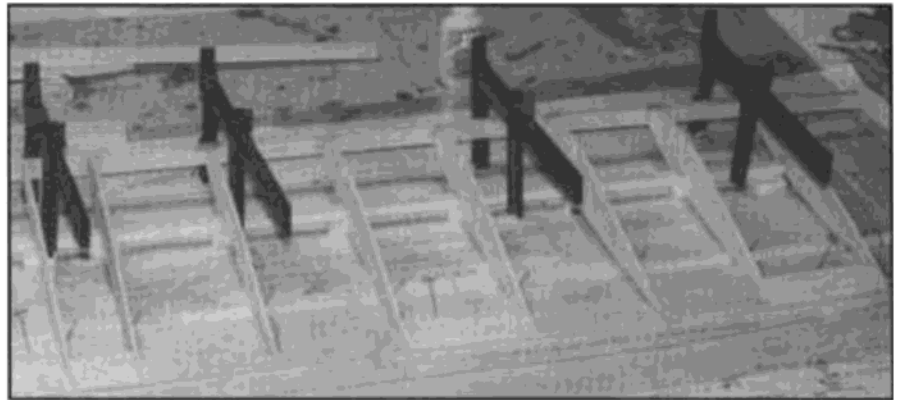
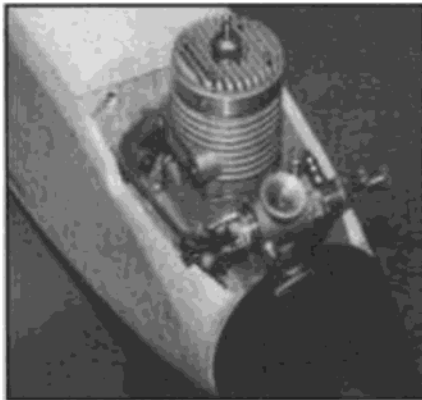
The plans were detailed with a .19 engine and I changed it for a .25. At the time, I noticed that Fox Manufacturing Company had just released the Fox .25 ball bearing engine in a new product offering and I proceeded to acquire one, as I thought I would use this new engine in the New Era III Revisited. I ran some ground tests on the engine mounted on a block. It performed extremely well with a 9 x 6 APC propeller, turning about 13,500 rpm. Accordingly, I decided to use this combi-



Fuselage sides placed on plan, ready for gluing. Heavy blocks on sides are for squareness and clothespin for rear clamping.



Fuselage construction in process; clamped, with die blocks for weight on balsa top during gluing.



LEFT: Fox .25 BBRC engine mounted with spinner — note blend of fuse front into spinner diameter. **RIGHT:** Leading edge clamped during gluing — rubber bands can also be used for this purpose. Note aileron hinge filler blocks glued in place.

nation on the final model.

I increased the fuselage length to accommodate the Fox .25 engine; redesigned the aileron pushrod arrangement by eliminating the bellcrank set-up; used flexible braided Du-Bro cable with nylon enclosures; changed the aileron mounting details; and employed the Airtronics #94141 servo. This servo is perfect for use with the ailerons as it has horizontal lugs molded on the servo case, which I found extremely helpful for mounting the aileron controls.

This was some of the "Besharizing" — now let's get on with the construction.

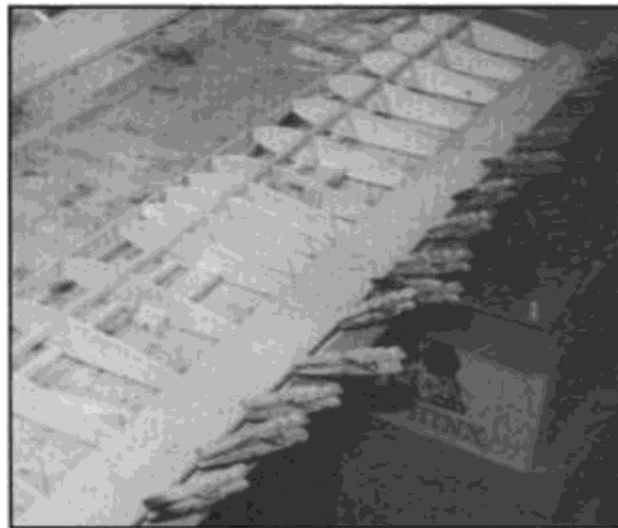
CONSTRUCTION

Wing:

The one panel of the wing is built and, when dry, is propped up 1", then the second panel is built against it for development of the dihedral. The wing leading edges are shaped from 1/4" by 3/8" balsa stock. The wing ribs are cut from 3/32" sheet balsa. Ideally, you can stack and cut them on a band saw, then sand to the outline as necessary; notch the spars and drill the 3/16" diameter hole as shown in the rib schedule on the plans. Check that the trailing edge bottom sheet edge is straight, and

trim the back edge with a straightedge, if necessary. Pin the sheet in position, butting the center joint tightly. Place scrap 1/4" sq. jig blocks under the bottom spar and install the tip rib and first rib near the center. Use the rib notches to locate the spar; note that the aft edge of the rib is inset 1/8" from the trailing edge sheet. Install the rest of the ribs, working inboard from the tip. Be sure that the ribs are flush with the bottom of the spar. Angle and glue the center ribs in place and finish installing all the ribs.

Add the 1/4" x 1" trailing edge stock fillers and the hinge fillers at the locations



LEFT: Trailing edge clamped with a series of clothespins, which serves well for this purpose. Clothespins also work well for holding the shear webs in place while glue dries.

where the aileron hinges are to be installed. (Use 3/16" x 1/2" balsa shaped to the contour of the trailing edge of the ribs.)

Install the top spar, gluing securely to the top rib slots. Check that the spar is flush with the top of the ribs and that the bottom spar is resting on the 1/4" sq. shims. Install and clamp 3/32" shear webs as shown. Apply glue to the aft edge of the top trailing edge sheet and to the rib surface. Place sheet in position and use 1/4" x 1/2", or similar strip, as a pressure strip at the trailing edge. Pin through the strip and sheet into the work surface. This will provide a dead-straight trailing edge. Don't use water soluble glues for this joint as they could cause curling or warping; use weights or pins to hold the front edge of the sheet firmly against the ribs. Apply glue to the front end of all ribs and install the leading edge. Use clamps or rubber bands looped over 2" to 3" lengths of 1/4" sq. scrap balsa placed behind the spars to secure the leading edge while drying. Remove the bands or clamps when dry.

Sand the leading edge to shape and install the top leading edge sheet, starting at the spar, and working toward the leading edge. When the glue is dry, reposition the wing on the work surface. Build second wing panel, and join the two panels together with 1" dihedral.

Complete top center section sheet and cut out center section to accept servo. At this point, we suggest that you lay the wing



Hardwood block with notch holds the Du-Bro flex cable in place during assembly of aileron pushrod cable.

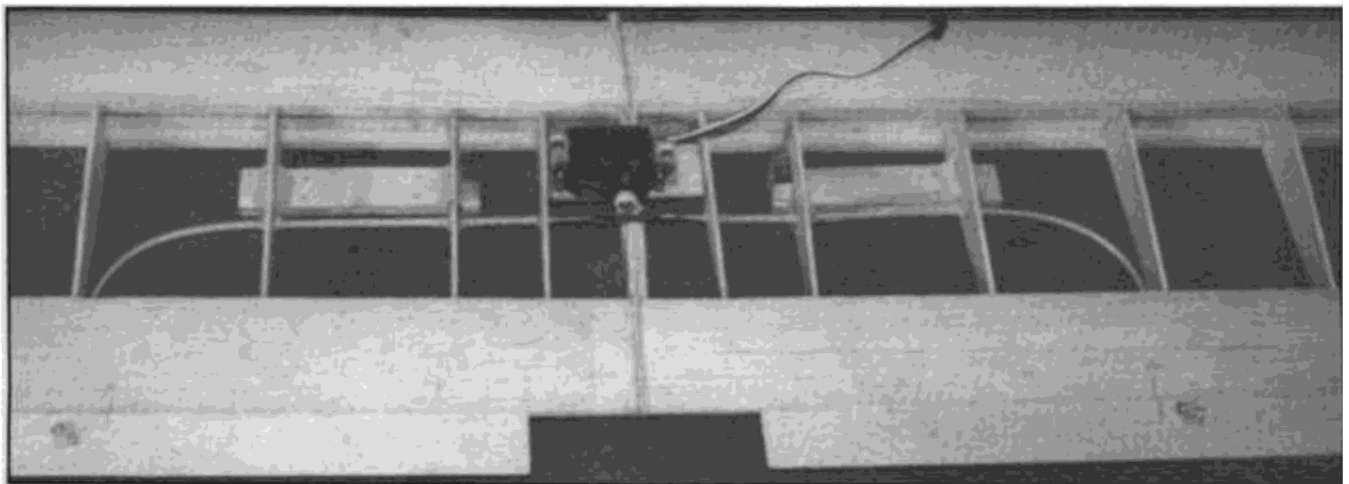
aside and begin the fuselage construction.

Fuselage:

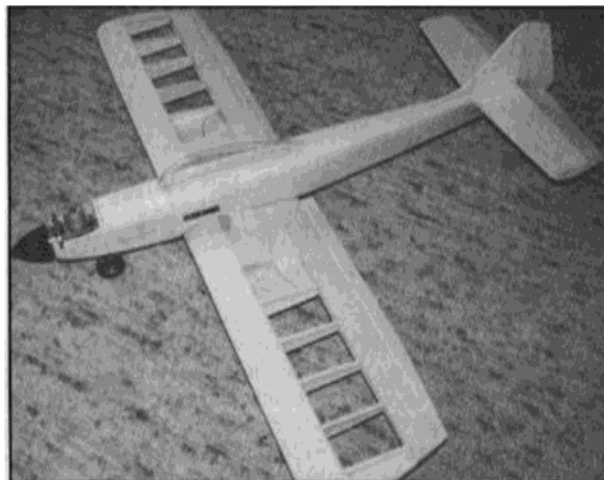
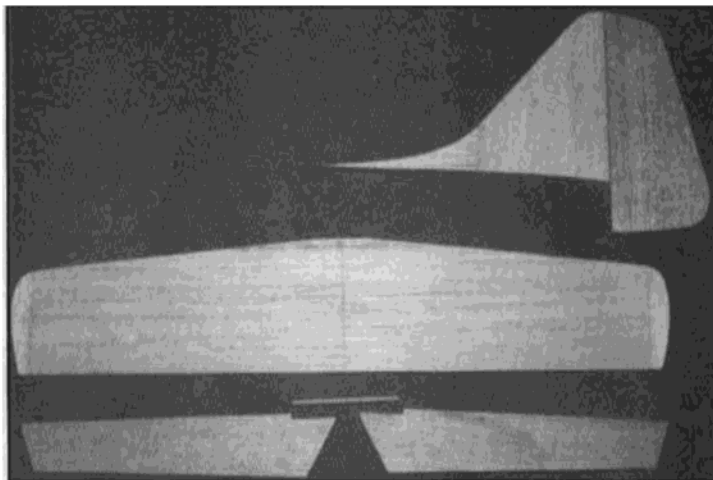
Cut and drill all holes in the 1/4" plywood fire wall F-1. The throttle pushrod location shown on the plans is for a Fox .25 engine, but can be shifted to suit the particular engine you select. Scoop a 1/16" deep recess in the forward face of the fire wall under the engine mount to clear the boss of the tiller arm. Install the 4-40 blind nuts on the aft face of F-1 and epoxy in place. Pin the 3/8" sheet top to your work surface, draw a vertical on the F-1, F-2A, and F-3 formers. Glue the formers in position, align-

ing the centerlines carefully and using a small square or triangle to check that they are square. Be sure that the fire wall is angled to provide the proper right thrust offset which is required. Remember the fuselage is upside down. Apply glue to one edge of the 3/8" triangular stock and glue to the top block. Use pins to hold in position and check that the outer edge is aligned with the edge of the formers. Let dry thoroughly.

Taper the inner face of the sides where they come together at the tail to provide increased gluing surface. Apply glue to the edges of the formers and triangular stock



Complete aileron servo connections in both wing panels prior to adding center wing section.



LEFT: Sheet balsa tail feathers. Hardwood dowel used to join elevators. RIGHT: New Era III is now ready for covering.

and to the top edge of the sides, then install both sides. Use pins, masking tape, or clamps to hold the sides tightly against the formers and to hold the tail post together.

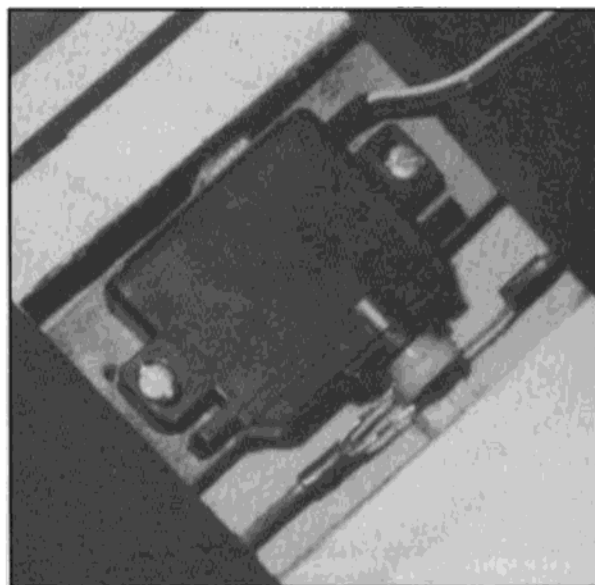
Install the 3/16" x 1/4" verticals forward of the F-2A, and epoxy F-2B in place. Add the 1/4" x 1" trailing edge stock reinforcements behind F-1. Epoxy the 1/4" aft hold-down plate to the face of F-3 and to the sides, then add the 1/4" triangular stock reinforcements. Install the 3/8" triangular

crosspiece behind F-1 and along the sides forward of F-1. Remove any pins inside the fuselage between F-3 and the tail. Cut the aft bottom sheet from 3/32" balsa sheet and install, starting at F-3 and working toward the tail. When the sheet has dried, the fuselage can be removed from the work surface.

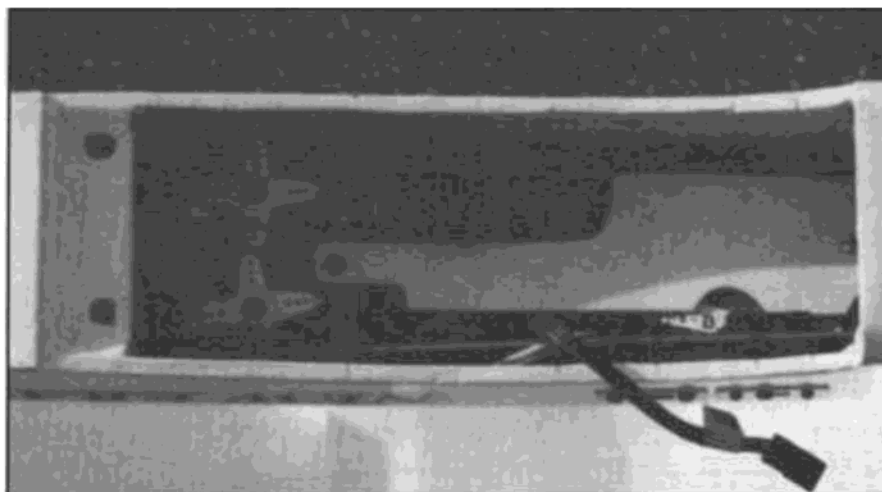
Lay out and drill the mounting holes for your engine in the mount, positioning the engine as far rearward as possible. Temporarily install the mount on the fire

wall, and install the front gear and tiller arm. Note that you will have to cut 1/4" off the end of the tiller arm and carve the triangular block to clear the tiller arm and pushrod.

Cut a 1" diameter hole in the forward chin block and drop over the landing gear. Check for proper clearance around the strut coils and epoxy the forward chin block in place. At this point, the forward wing hold-down should be installed. Sharpen the end of a piece of 1/4" o.d. brass tubing to act as a



LEFT: Nose section after covering. RIGHT: Close-up of Airtronics 94141 servo mounted for alleron control.



Inside view of radio components with lite ply hold-down panel.

drill, and check the fit through the hole in bulkhead F-2B. Trim and sand the wing leading edge in the center for proper contact with the fuselage, then position the wing on the fuselage. Hold wing tightly in position, making sure that the center joint is aligned with the hole in F-2B. Rotate the tubing through F-2B and drill through the wing leading edge. Check that the hole lines up with the slot in the center wing ribs, and temporarily install the 1/4" diameter hold-down dowel. Check alignment again and set the wing aside while you finish the fuselage.

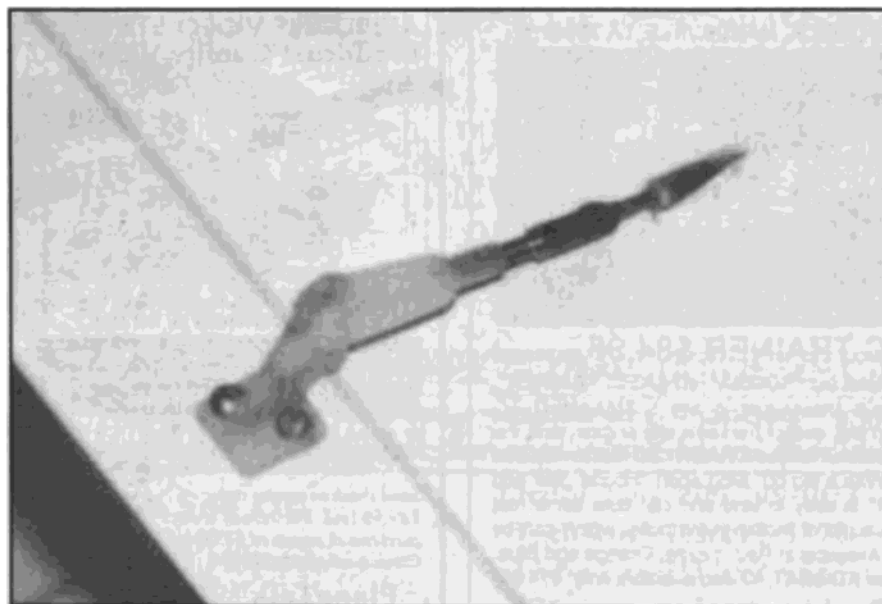
Mount a prop and the spinner on the engine and place it on the mount. Mark and trim to size so there is a 1/8" gap between the spinner back plate and the fuselage. The 1/16" ply nose ring is shaped and epoxied to the nose, using the spinner to align the ring properly. Add edge reinforcements and the 3/32" sheet fillers to the top edge of the engine compartment. Trim the top edge of the right side to clear the muffler, if necessary. Remove the engine and mount.

For fuelproofing, apply two coats of Coverite's Balsarite to the inside of the engine and tank compartments and sheet-

ing. Install the rest of the sheet and lay the fuselage down, right side up, while the epoxy dries.

This completes the construction of the fuselage which is now ready for final carving and sanding. Shape the top block after the wing and tail surfaces have been completed, as the square surfaces provide better alignment references.

Using epoxy, glue in place the 1/16" plywood landing gear plates, aligning with the rear edge of the top spar and lower surface of the ribs. Be sure to locate the plates properly. When dry, trim the balsa flush with the notch in the plates and check the fit of the trunion blocks. File or carve a chamfer on the inboard edge of the slots in the trunions to clear the radius on the gear leg before installing the trunions. Epoxy the trunions and the 1/4" triangular reinforcements in place, making sure that the bottom surface of the trunion is flush with the ribs. Slip the gear leg in place and install a vertical block sighting from the wingtip to be sure the gear leg is perpendicular to the rib surface, and that both gear are aligned. Remove the gear.



Du-Bro flex cable protrudes cleanly from wing and connects to aileron control horn.

Install the 1/8" ply servo shelf and the 3/16" x 1/4" reinforcements as shown on the plans. Locate and mount the aileron servo (Airtronics #94141), mounted on 1/16" foam sheet, with two 3/4" sheet metal screws and rubber grommets for isolation as shown. Other servos can be used if desired. Hook up the Du-Bro flexible pushrods to the servo, using two Du-Bro soldered links #999 modified by cutting off the pin side of one link and hooking together the remaining pin as shown in the detailed aileron sketch on the plans. Check servo action to be sure of proper movement of the pushrods.

Install the bottom trailing edge and the center section sheet. Run a 1/8" drill through the landing gear vertical block and bottom sheet to locate the inboard end of the landing gear slot. Cut the slot for the gear legs and cut-outs for the retainers in the bottom sheet. Drill 1/16" diameter holes for the retainer screws and the trunion blocks.

Install capstrips and trim the leading edge, spars, and sheet, flush with the tip rib, and add 1/4" tip balsa sheet. Cut and install the forward and aft tip blocks. When dry, carve tips to final contour, shape the leading edge, and sand entire wing.

Wrap the entire center section with fiberglass or nylon tape at least 2" wide. Secure the tape with epoxy. Note: The wrap is essential for proper wing strength. Insert the leading edge dowel and position wing on the fuselage, check the fit of the wing saddle and be sure that the wing is properly aligned in all planes.

Drill through the wing and fuselage hold-down plate with a tap drill, align perpendicular to the lowest surface of the wing. Remove wing and tap the plate with #10-32 tap for the hold-down bolts. Use a 13/64" diameter drill to enlarge the holes in the wing to clear the nylon bolts. Reinstall and check for proper alignment.

Cut out and shape the aileron stock to a sharp trailing edge, bevel the leading edge of the aileron as shown on the plans, cut hinge slots and insert hinges. Hold the ailerons against the wing trailing edge to locate the slots with the trailing edge. Temporarily install horns and clevises as shown, and check for free and clean operation.

Tail Assembly:

Cut the tail surfaces from 3/16" balsa, install the 3/16" x 1/2" anti-warp tips on the stabilizer, and shape the tip contour. Epoxy the 3/16" diameter dowel joiner between the elevator halves, using the trailing edge of the stabilizer for alignment. Bevel the leading edge of the elevator, cut slots for hinges in the stabilizer and elevator, and install hinges in the elevator. Fit the hinges into the stabilizer, but do not glue in place.

Use a razor plane to taper the elevator, plane only one face, then block sand, using the stabilizer as a handle. Round the tips and stab leading edge by joining the stabilizer and elevator; this way, all edges can be blended easily and the risk of hinges pulling through the surface is minimized. Bevel the leading edge of the rudder and join to the fin as described above. Taper the rudder and sand all edges, except the fin leading edge where it is joined to the dorsal fin. Install the rudder hinges as shown on plans.

We can now complete the fuselage. Before carving the top block, tack glue a 3/16" x 1/2" spacer in the aft end of the stabilizer and fin slots. These spacers will support the aft end of the top block during shaping and prevent the ends from breaking during handling. Draw a centerline on the top for a guide while shaping. Use a razor plane or knife to slab off the corners of the top block and sides, then start shaping the contour. Follow the cross section on the plan for proper contour. Block sand until the edge of the 3/8" triangular stock is just visible. Taper the aft top surface, starting at the forward end of the dorsal fin, following the side view on the plans. Round these corners smoothly. Shape the aft bottom sheet corners with a coarse sanding block, since a knife will tend to gouge out the cross-grain balsa sheet. Carve and sand the nose and chin area, rounding the corners to fair smoothly with the nose ring and former F-2B.

Cover the engine intake and exhaust parts, and wrap the spinner with a couple of layers of masking tape for protection. Temporarily install the engine and use the spinner as a guide for final shaping.

Mount the wing on the fuselage temporarily, and remove the tail spacers from the slots. Insert the stabilizer into its slot and sight from the front to check alignment with the wing. When satisfied, epoxy stabilizer in place, checking alignment in all planes very carefully. Slip the fin into the fuselage slot and seat firmly on top of the stabilizer. Trim the lower surface of the dorsal fin to fit tightly against the top block, and glue to the fin. Remove the fin assembly from fuselage and shape the dorsal top outline, and sand contours into the fin. Cut hinge slot and aft fuselage and glue fin and dorsal to fuselage. Check alignment and be sure the fin is seated on the fuselage.

Temporarily mount rudder and elevator horns and attach surfaces. Check the direction of movement of your servos, lay out and install all pushrods. .062" diameter wire is used for the throttle and nose gear, running in 1/8" o.d. nylon tubing. The rudder and elevator pushrods are Sullivan NyRods. Cut holes through the sides in F-3 to suit your installation, be sure that the rudder pushrods exit through the correct side, as does the elevator, as shown on the plans. Trim canopy to fit the fuselage. Wrap #120 sandpaper around fuselage and carefully sand the canopy for final contour. If you plan to add cockpit detail, make up the parts now and fit to the fuselage contour. Mark and cut out forward fuselage hatch cover with a razor saw.

The Williams Bros. 1-1/2" scale pilot is the right size for this aircraft. If you look closely at the photos, you will note the pilot in the model, shown in this article, contains a rendering of the author, which was provided by his son, Marc.

This completes the construction of the New Era III Revisited. Go over the airframe again with fine sandpaper, filing all dings and cracks; use filler as necessary so there is a smooth surface for the covering. Use a tack rag or blow all dust off the parts, making ready for covering with your favorite heat shrink covering.

Check the landing gear alignment, saddle fit, and the wing and tail alignment. The New Era III Revisited was covered with Coverite's 21st Century Fabric covering, which provides strength and rigidity, with minimal weight. Cover the bottom of the wing first, then add the aileron horn links, check for operation, and cover the top of the wing and ailerons. The bottom of the fuselage is covered first, then each side and, finally, across the top of the fuselage, terminating at the sides. This completes the fuselage covering. Cover the tail surfaces, trim to suit, complete any detailing, and glue the canopy in place with RC-56 glue by Wilhold.

Make up pushrod ends and attach to control surfaces as shown. Install fuel tank, engine mount, connector tubing, landing gear, wheels, and connect the nose gear pushrod. Mount engine permanently, hook up pushrod to throttle arm. Install servo rail as shown or to suit, and mount the servos. Make up the inboard pushrods and check control movement. Position the battery and radio equipment so that the complete model balances, as shown on the plans. Check out in accordance with standard procedures for trimming out a new pattern ship.

In flying the New Era III Revisited, you will find that it will far exceed your expectations for this size ship. In fact, I'm willing to bet that its performance, coupled with its overall economy, ease of construction and transportation, will have you hanging that .60 powered ship on the wall for a while, as you will be using half the fuel, but enjoying flying as much, with the convenience of transporting it assembled -- a winner.

