They don't make 'em like they used to . . . men, that is. Graham Lomax looks like a midget sitting at the wing tip. Wing covers hang over fence. When on wings, pizza and beer is served. Wing seats six with ease.

ALMOST A FAIRCHILD

One of the finest aircraft construction articles ever presented by RCM, Robert Lopshire's Fairchild F-24-H is an .80 powered Stand-Off Scale model that you won't be able to resist.

What you see on the cover, and in these pages, began life as "Mr. Mulligan" at a luncheon over a year ago. If you read my article last month of the business of starting an "Innovator's Class" of competition, you'll remember that a modeling drop-out and I got to letting our minds drift back to the "good old days" and that we yakked about the business of building a big plane that would fly at scale speeds. The MDO, Carl Cantera, and I agreed on the basics . . . but not his suggestion of Mr. Mulligan, Benny Howard's magnificent classic of 1934. Like Carl, I'd always loved the plane, but to build a model of it didn't grab me. We'd decided on at least an 8' span, and the cowl on Mr. Mulligan scaled up to the size of a washtub.

My all time favorite for being a great flying machine as a model was DeHavilland Puss Moth. I built one at the age of 8 and had instant success with it. I pushed my point and Carl grudgingly agreed to let me have my way since I said I'd scale it up and build it and he could fly it. (As mentioned in my previous article, I could care less about flying the things, but, oh, that drawing board and building!) Now the plane was a Puss Moth.

Then letters to the Smithsonian and God's gift to scale modelers, Claude McCullough, along with several letters to England, proved something important — no one had any real good plans for the Puss. Some itty-bitty three-views did come back, but nothing good enough to make and 8-footer out of. Too, Carl saw the photos and three-views and went back to mumbling about the idea of a Mr. Mulligan.

Then I thought of a plane that had to have been influenced by the Puss . . . the Fairchild Ranger, or more correctly, the Fairchild 24. The name "Ranger" came only from the fact that the planes built with an in-line engine used the Ranger engine. The other version of the plane used a Warner "Super Scarab" radial engine . . . which, if built, would put us back at the Mulligan configuration of a whopping big cowl, and all that prop effort going for naught.

Back to Claude McCullough, and a letter to Bob and Dollie Wischer, and I had a surfeit of info on the Fairchild, along with some info from Steve Sauger

who was building a Fairchild for his entry on the U.S. Scale Team. Carl allowed as how this looked more like his idea of a neat airplane and, since I agreed, I sat down at the mighty drawing console and began to doodle. Lou Proctor stood over me as though transposed from San Diego, and repeated his hallowed words . . . "Every model should be builteth as though a home-built that one might flyeth himselfeth . . .", or something like that.

Carl and I had agreed that to build and fly a **true** scale ship for **fun** would be something akin to rolling a marble down the center stripe of 42nd Street in New York at rush hour, pushing it with your nose. In that moment of truth, coupled with a desire to build something that looked like a real plane and flew like one, the "Innovator's Class" idea was born. The longer I sat at my drawing board, the more the idea became valid . . . and the Fairchild began to get redesigned in a number of places.

First place of changing the factory scheme came when I took a look at the top view of the original. Looked like a pregnant guppy. A bit of a shock to the design senses since the Fairchild had always looked so slim and sleek in photos. The scaled-up fuselage width of 10½" was chopped down to 8½". After all, esthetics had to be considered here, and besides, no people were going to sit in the silly thing anyway. So the seating became a tad squashed, who cared?

The next major change was to get rid of the original idea of welding a mounting up from the axle to fit the main oleo onto so it would exit the wheel pant at the scale position. Most modeler's don't have welding outfits, nor do they work with materials readily weldable in the small scale worked with. I went for a more direct approach of mounting the oleos; I used portions of two hinges made by the Stanley Company. I **could** have used longer versions of the hinges to obtain a scale effect, but my personal opinion was that they would have been a bit flakey for strength, and besides, I wasn't after scale so much as I was after a realistic looking plane. I opted for the short hinges. Only a Fairchild fanatic, or a scale judge armed with plans would know the difference in the finished product.

Another design feature bothered me . . . a portion of the color scheme that Fairchild put on the original ships. This concerned the area around the cabin. Fairchild had all this painted the same color as the large trim panel, and the result was that it all pretty well blended in with the dark cabin. As an artist, I took the liberty of changing all this by using white around the cabin and windshield to set these parts out. As inventor of my own little contest, I'm allowed. . .

In actuality, although I departed from scale, I stuck closer to it than I would see for those who might become interested in a "Innovator's Class", where one would be free to mix airplanes to obtain a final result. My approach was fairly mundane, much more the way a kit maker might approach a project, but I did discover some things along the way that hadn't, to my knowledge, been used before.

The original plans for the ship were made by working from all the three-views obtained. All that was needed for what I had in mind when setting out to design the ship, and what I foresee as the way for the group who might get interested in my proposal for the "Innovator's Class". However, I did take the time to trot to a local airfield and make a few dozen shots of a full scale Fairchild F24HR . . . which proved the plans that I'd been working with were absolute liars. Not shown on any of the American plans was an item at the rear of the fuselage that I've dubbed, for lack of any mention anywhere, a "fishtail". This gizmo flares out to fill the gap between the elevator sections and carries the rudder cables. Funny thing here was that only an English plan sheet showed the thing until I saw the real ship. Since I'd planned cable controls to the rudder, the sight of how it all worked solved a number of design problems at this end of the fuse.

The American plans showed a metal tail wheel housing. Not so on the real McCoy. The item is a canvas boot fitted over heavy curved rods, top and bottom . . . a snap to duplicate with Indian Head cloth stitched over soft wire frames. To keep these fuelproof, I coated the finished product with polyurethane varnish. Not to be "scaley", but to add a touch of realism.

The flaps on the full scale ship show a three point mounting which wasn't in keeping with the materials we work with. Fine with steel and aircraft bolts, but not with plywood and funny little hinge methods. I changed the hinging to four from three and, while making the hinges somewhat realistic, I shot for strength and reality of function, rather than true scale. More on the hinges later.

On the original Fairchilds with Ranger engines, the exhaust stacks, two of them, protruded from a slot on the right side of the engine cowling at the very bottom. Modelers don't have many options where engines are concerned, and

Brand spanking new Fairchild-24 just flown from factory to California by Pappy Beale (on left) for his flying school. Dick Kidd (on right) had the pleasure of flying this while working on his commercial license. Photo taken at El Monte Airport, Calif. in the late 40's.

FAIRCHILD F-24-H
(Army-UC-61-K)
Designed By: Bob Lopshire

TYPE AIRCRAFT
Stand-Off Scale (2½" = 1')
WINGSPAN
91¼" (Scale 93¼")
WING CHORD
14 Inches
TOTAL WING AREA
1165.5 Square Inches
WING LOCATION
High Wing
AIRFOIL
Clark Y
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
2 Degrees
OVERALL FUSELAGE LENGTH
63¾" (Prop nut to Rud.)
RADIO COMPARTMENT AREA
Size Dependent on Scale
Interior (Ample Room)
STABILIZER SPAN
30⅛ Inches
STABILIZER CHORD (incl. elev.)
7¼" (Avg.)
STABILIZER AREA
195 Sq. In. (Approx.)
STAB AIRFOIL SECTION
Symmetrical
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
7 Inches
VERTICAL FIN WIDTH (incl. rudder)
10" (Avg.)
REC. ENGINE SIZE
.80 or larger
FUEL TANK SIZE
14 Ounce
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
5
CONTROL FUNCTIONS
Rud., Elev., Flaps, & Throt.
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa, Ply & Hardwood
Wing ..... Balsa, Ply & Spruce
Empennage ..... Balsa, Ply & Spruce
Wt. Ready-To-Fly ..... 258.4 Oz.
Wing Loading ..... 30.15-31.9 Oz/Sq. Ft.

There are 5 full size plan sheets available for the construction of the Fairchild. Due to space, only 1 sheet of the 5 sheets has been shown. Plans are highly detailed and show both civilian & army version. All areas that deviate from scale have been referred to on the plans. This was also done in order to show all of the detailed construction photos.

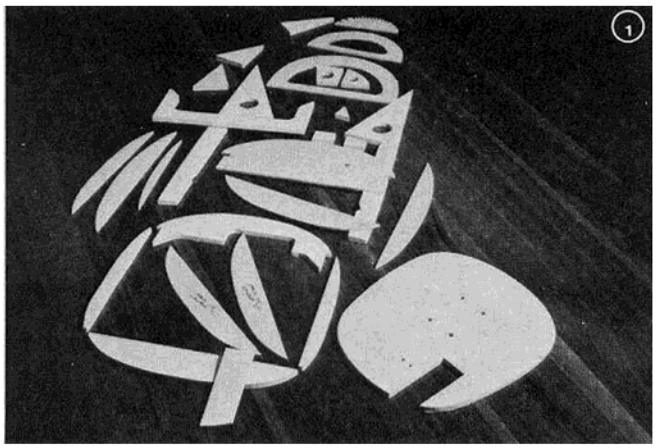
"That pylon should be around here somewhere . . " Shown here on the maiden flight, the Fairchild proved very solid in the air, even had full aileron control with flaps at full down. Rudder was only used for ground handling.

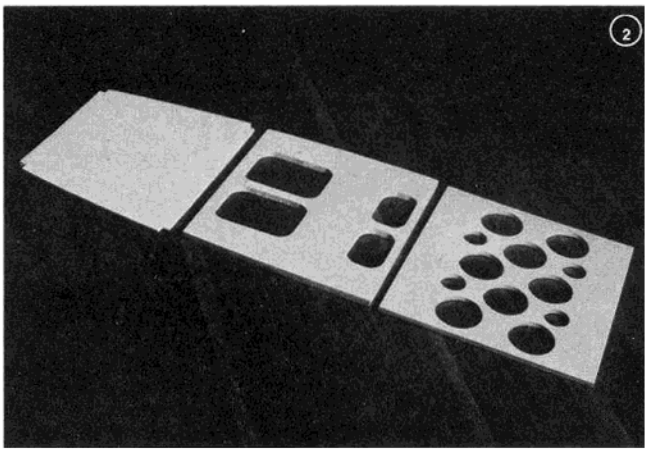
since I'd decided on an O.S. Max .80, I had no options whatsoever. In the inverted mode, the Max blows its waste out but one side . . . the left one. So, I reversed the exhaust location, and turned it into a double function . . . an exhaust/cooling tunnel. The exhaust fires straight down from the Max through a Tatone manifold, but cooling air from the front cowl openings is drawn over the engine to flow down and out through that tunnel. The Tatone manifold is **loosely** stuffed with "Chore Girl", scouring pad, to serve as muffling material. A Lou Proctor idea. The touch of realism is the two exhaust pipes that protrude down out of the slot . . . both a pair of absolute phonies. By the way, the pencil shown in the photo of the pipes and their fittings, is a "Stabilo-8008". Available at art stores, they will write on anything but grease. To clean off, wipe with water, alcohol, or lighter fluid.

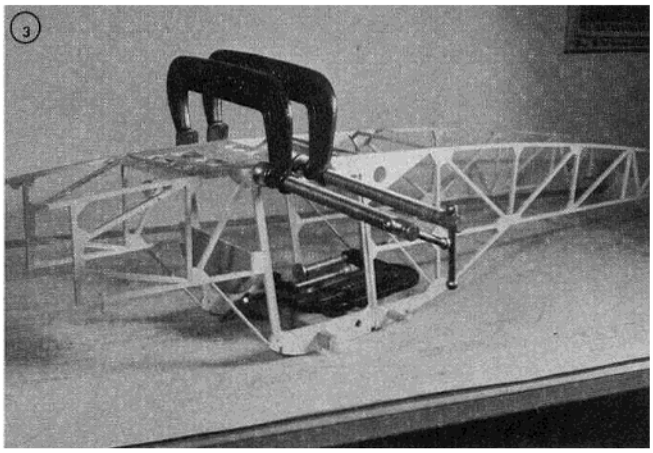
Because I'd formed the original AMA Show Team as a PR device for the Academy, and modeling in general, I'd also pitched in and helped them a bit by building planes for them. One of the ships was a Span Aero Piper J-3 with an 8' span. Started by one of the members of the Team, I took it over and finished it, installing drop bay, tow hooks and releases, etc. To put all this extra weight on the ship, I gutted the plane, taking vast liberties with structural members. How clever of me, I thought, until we took the thing to a show and Austin Gutman, the drop-pilot, tried to land the beast. It simply wouldn't come down! Lesson learned, build the biggies **heavy**. Later talks with Bob Karlsson and Graham Lomax, both experienced with large planes, bore out this lesson. Shoot for a wing loading of 32 ounces per square foot. The "Almost A Fairchild" hits this weight loading precisely. Because of the Show Team, mention of a bay area is made on the plans, although none was included in the model built.

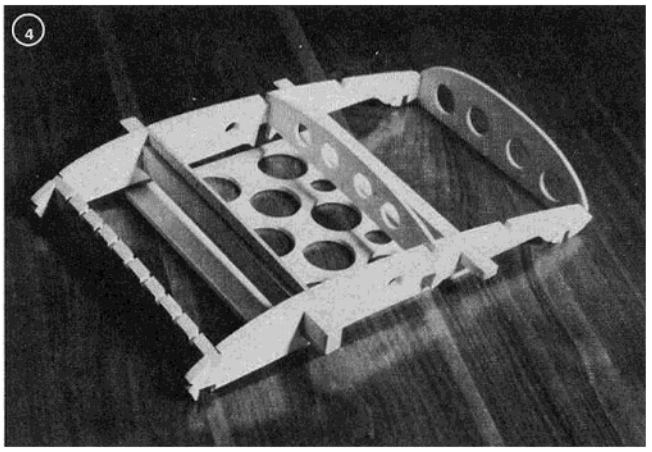
I said that the ship started out as Mr. Mulligan, then became the Puss Moth, then the Fairchild. I had my private pet names for it too as the project progressed. In the doodling and drawing stages, I referred to it as the "Paper Monster". In the building stages it became the "Spruce Moose", and I confess that all during the building, I kept an anxious eye on the door, with feelings that maybe the thing would get so big it would never leave the room. In hefting it around to work on it, I gave it another name — "Hernia Helper".

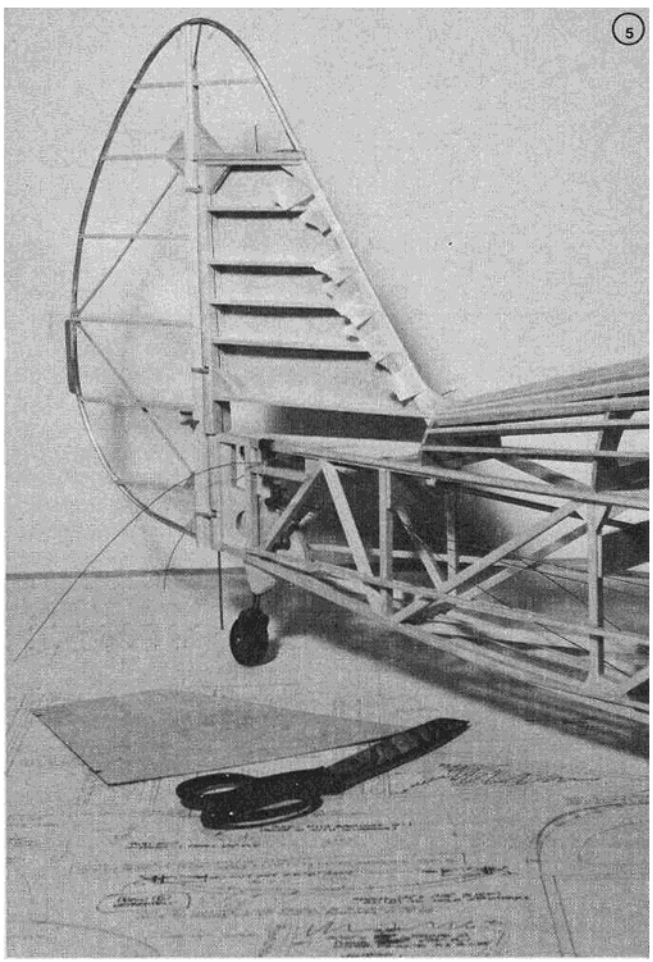
About here, I should mention that the beast was built in an apartment, which called for certain ground rules. No dope for one thing. Sawing, banging, and the like had to be done when I knew that the librarian who lived below was gone. It was frustrating at times, especially late at night when I wanted to get out an anvil and a hammer to form a part, or when I had a few acres of plywood to whack into formers on my jigsaw. The entire apartment has wall to wall **shag** carpeting . . . and you've never lived until you go looking for a dropped screw in a shag carpet. The shag had me running a vacuum cleaner almost constantly, and painting became a nightmare; shag has a habit of somehow putting a constant supply of fuzz in the air, and every last hair of it goes straight to fresh paint.

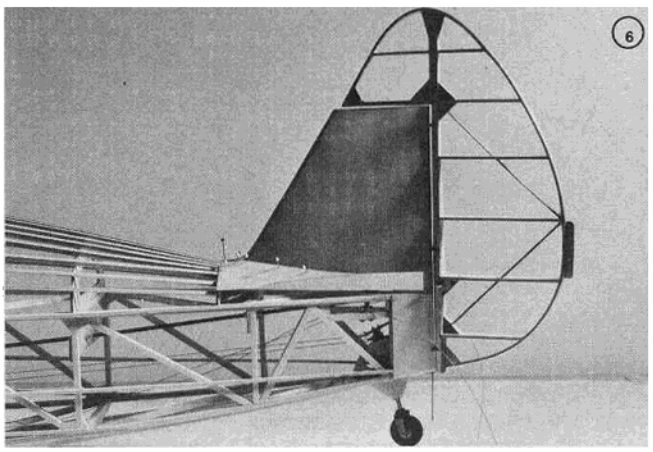












(1) Entire plane "kitted" prior to any assembly. Most of the fuselage parts shown here. All ply, no balsa used. (2) Right to left — upper cabin plate, 1st cross member installed in fuse; landing gear mount plate, 2nd cross member installed. Fuse now auto-aligned. Tank deck goes in next and gives correct curve to sides at nose. (3) 10" C clamps used to clamp landing gear plate in place, other clamps used as weights. Former at instrument panel not glued in yet — just in to check that whole mess is square. Wing mount stubs also in just for alignment. All structure is 1/4" sq. spruce, all gussets are of 1/4" ply. (4) Top of cabin parts fitted together for photo only. Rib-like sections are part of fuse sides. Large ply plate at bottom of assembly fits between rib sections and auto-aligns entire fuse. Plate is first cross member installed when joining the two fuse sides. (5) Rudder mounted to fuse and fin half covered with 1/32" ply. Large shears used to cut ply. Trim tab is .015 ABS mounted into slot cut with Dremel Moto-Tool and Dremel rotary saw blade. (6) Fairing skirt fitted to rudder and fuse. Epoxolite used to complete the fairing. Masking tape was later used to achieve fairing ends on rudder and elevator. Double thickness of tape gives right effect.

Rather than get into that business of "glue stick A to stick B" sort of construction article which I don't think anyone ever reads anyway, I'll mention some of the highlights, and some of the discoveries I made in the building. The plans were drawn and enough notes made on them to serve as a **visual** construction article. (Five sheets, roughly 3' x 6' each).

A few other Lou Proctor ideas were incorporated in the construction. Bamboo was used as internal structure bracing, much the way the Antic uses it to gain strength. Per Lou's suggestion, Duco cement was used to fasten the bamboo braces in place. Duco seems to have a pulling effect on bamboo, stretching the pieces taut. The combination was used in the outer sections of the wing as anti-twist braces, just as the full scale ship had at those points. Same in the rudder.

Note of interest to anyone who wishes to use aluminum tubing such as I did for the rudder outline . . . if you try to cover it with MonoKote or a similar product, forget it. The aluminum acts as a big heat sink and the material will not stick. I overcame that little obstacle by cutting the rudder outline slightly oversize from typewriter paper and gluing the paper to the aluminum with Titebond. Instant stick for the MonoKote.

In the photos, and on the plans, I make frequent mention of "3 ply Strathmore". Strathmore is a high quality drawing "board" used by artists, mainly for pen and ink work. Mistakes can be scraped off with a razor blade, and electric erasers don't faze it at all. It is also stable to a high degree, with moisture having little effect on it, and, bonus extra, paint and MonoKote love it.

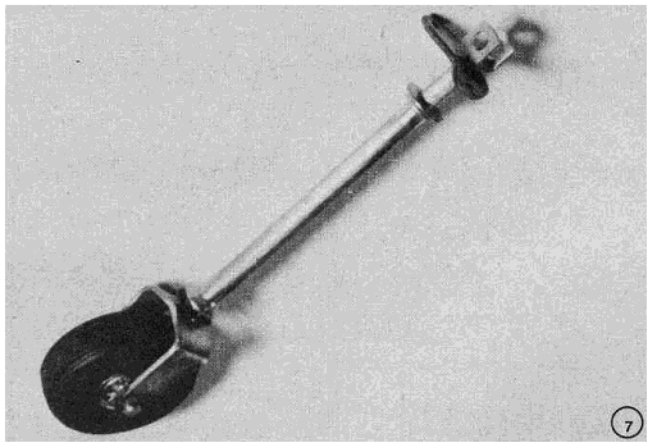
I introduced the Show Team to Strathmore as a covering for foam wings, and while Jack Salmon, Team Manager, fought me on it, he grudgingly tried it on some foam wings and fell in love with it. It's tough, and it won't split like balsa. I've used it on the Fairchild in a number of places: to cover the main landing gear struts, cover the doors, make the simulated steel fairing plates on the landing gear, etc. You'll find it in art stores under the name mentioned, and once in a blue moon under the name "Bristol Board", but I prefer to avoid the latter since art store people haven't too clear an idea of what constitutes a true Bristol Board. At this writing, Strathmore goes for around $2.40 for a 30" x 40" sheet. It also comes in one and two ply as well as three ply, and in two surfaces — kid and plate. I used the kid finish.

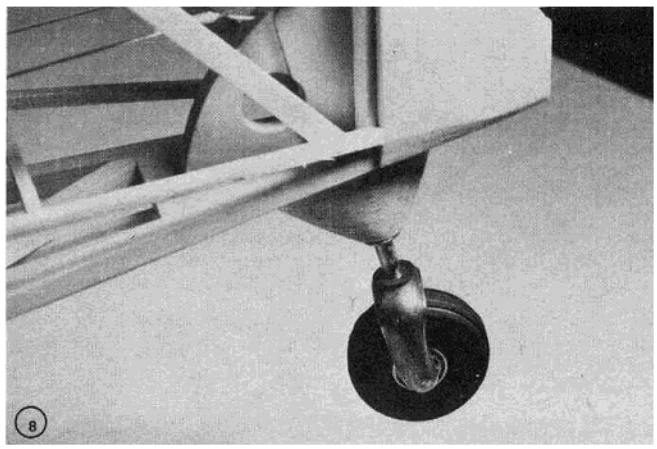
Not many models have silver-plated door handles, but the Fairchild does. The handles, like the tail wheel yoke, were built up over metal forms using Devcon AL-40, a metal in paste form that dries a flat grey, but buffs up to a metallic sheen. The silver plating was done by applying silver foil over the built up handles. This foil is also available in art stores or large hobby shops and is very simple to use. A coat of Adhesive Size is brushed on the surface to be "plated" and let dry for about 15 minutes, then the foil is applied by dangling a sheet of foil in place and using a dry, soft brush to pat it into the adhesive. A coat of clear dope or lacquer should be put over the finished job because it **will** tarnish. Because the ship is white, with blue and gold trim, I was tempted to gold-plate the handles . . . but I kept it pure.

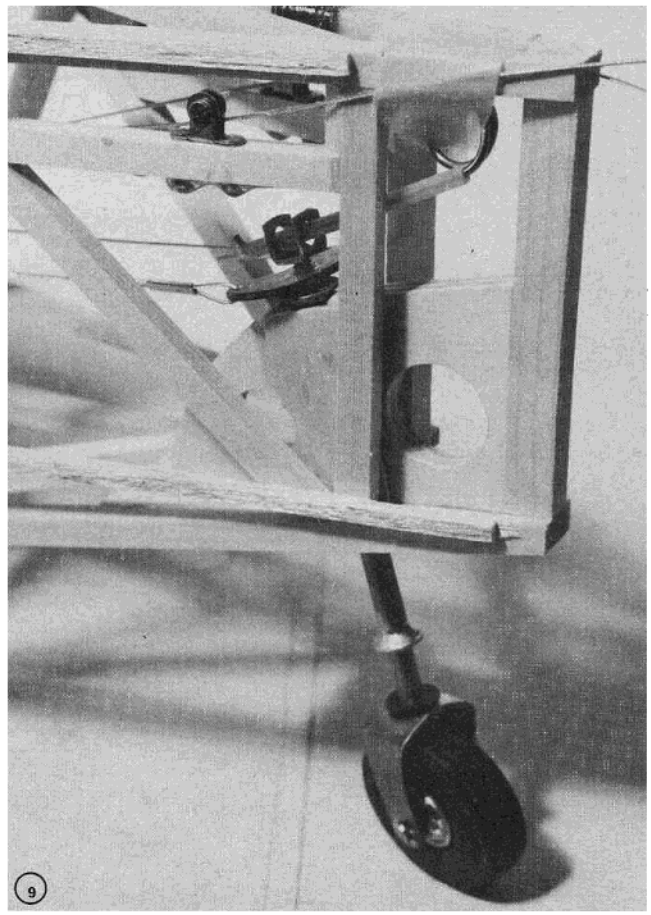
While I decided to give Fairchild credit, in spite of what I did to their airplane, I was about to make the company ident decals for the tail when Bob Karlsson (the Corsair nut) dropped in and asked how he might put the name on his latest creation, a Curtiss Robin, or whatever. Rather than going into the business of making decals, try buying some Windsor & Newton opaque water colors and mixing them on a white plate (only way to get true colors) with some soap. The soap should be the bar type, and the addition of it makes the paint adhere to slick surfaces. Make a mistake and all you have to do is wash it off and try again. Once dry, put a coat of clear over it and it will match your plane and be waterproof. Note that I said **any** slick surface — that includes MonoKote. In this case, top coat it with polyurethane varnish.

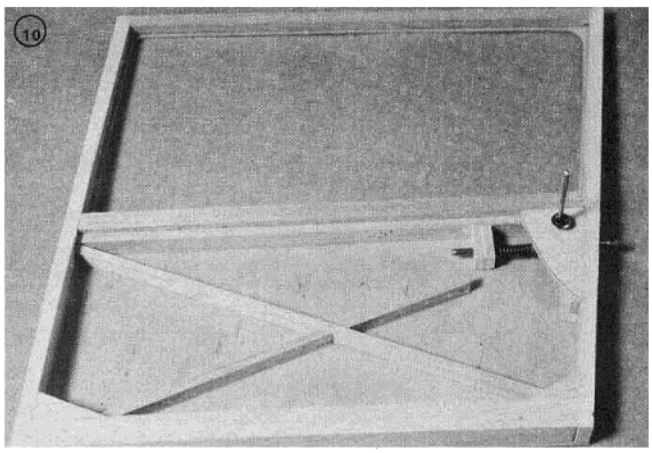
The running and position lights were made by filling gelatin capsules with epoxy and cutting them down to the required size — something I regarded as an old trick, but one the fellows around here hadn't seen. It takes some snooping in a drugstore to find the right colors and sizes, but they're there if you look. I used one half of a "Contac" capsule for the white position light, and the other half for the red port wing light. A Vitamin B complex capsule yielded the green starboard wing light. All are coated with polyurethane varnish to make them waterproof.

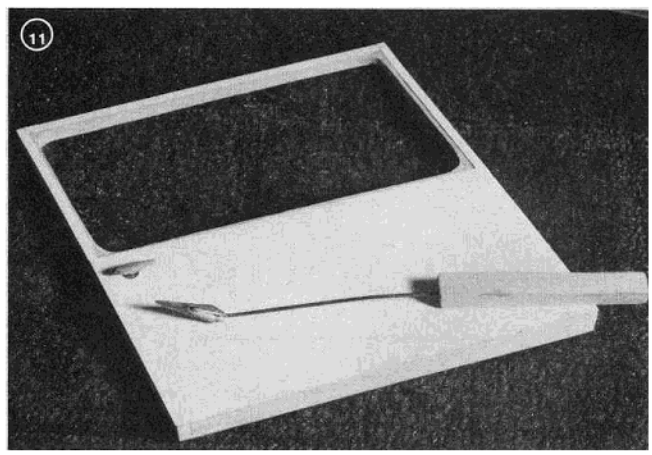
In that I've never really been in love with music wire landing gears, I decided from the outset that this ship wouldn't have one. The big main gear was first drawn up to work as hinged legs ala the real plane, but the limitation of our sizes ruled it out, so I went for the one piece spring steel jobbie. While the oleos work, the spring steel carries the weight and does most of the work. Later, it dawned on me that something else I'd stumbled on would have worked for the legs I had in mind originally — cotter pins. I was in a hardware store looking for the thumb screws used to hold the



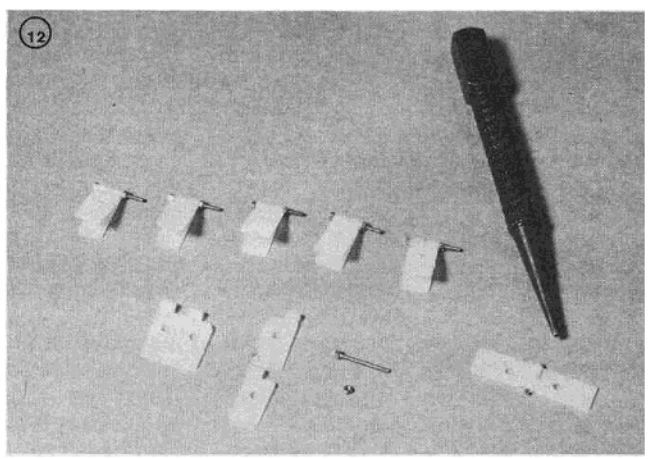


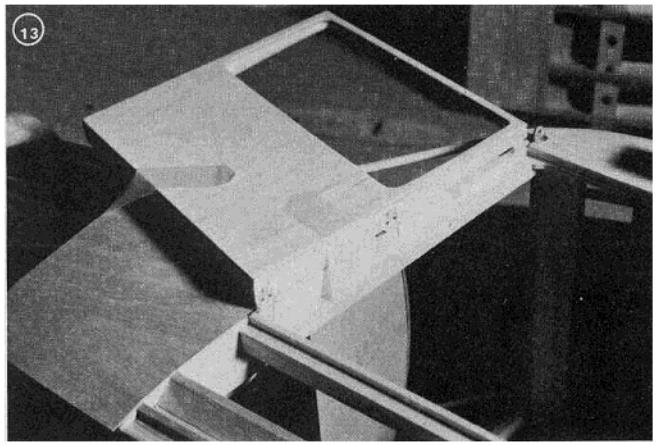


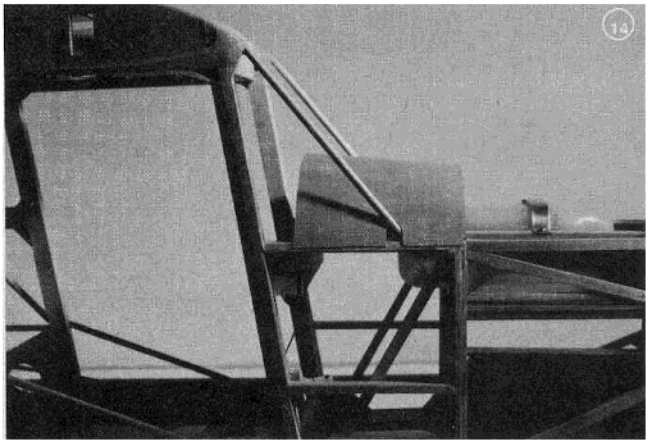


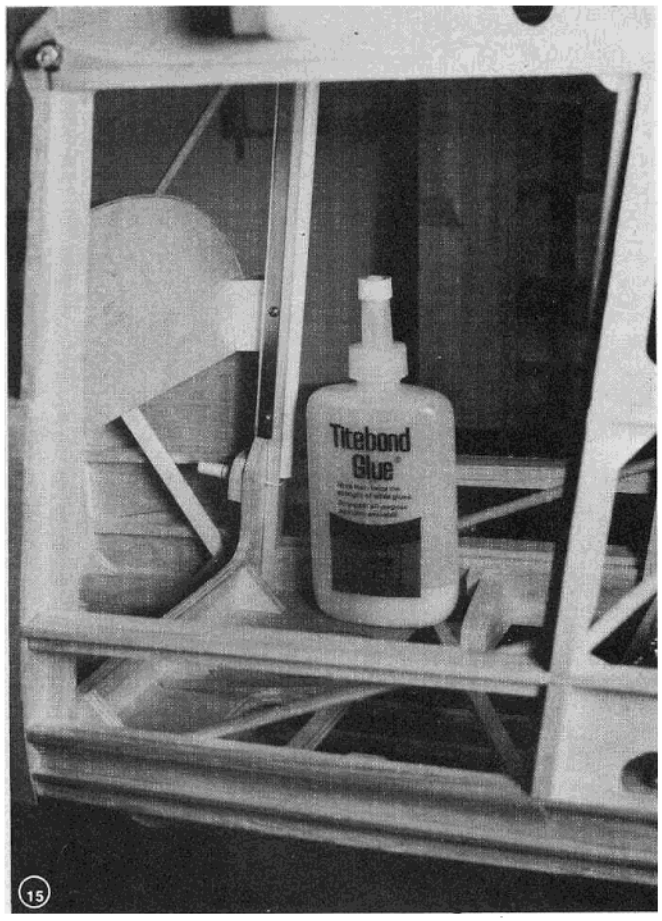


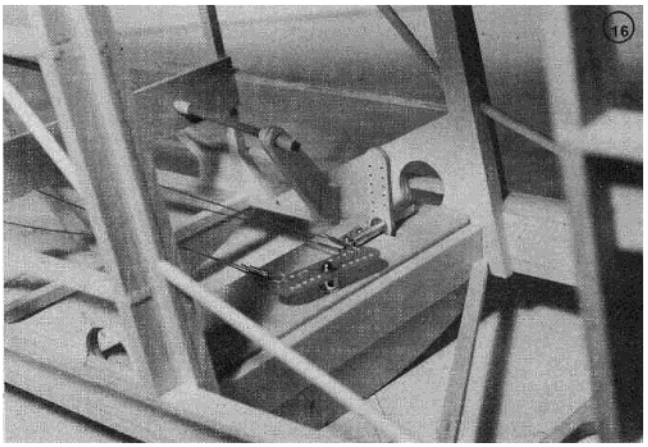
(7) Tail wheel "oleo" assembly. Tube at center is epoxied into a ply sandwich, rest of unit free to move up, down, right, left. Spring mounts thru fitting at top. Cables affixed to both sides of horn at top. (8) Tail wheel collar built up to shape using "Devcon AL-40". Balsa cuff on oleo tube is covered by cloth stitched to wire frames, top & bottom. Rudder hinge wire buries into balsa. (9) Tail wheel assembly mounted in place w/spring. Length of plastic tube over spring end to insure no metal to metal "noise". Cable guides & cables installed. Cables to tail wheel must be slightly slack due to angular travel of tail wheel on the vertical. (10) Interior of door — both made the same in right & left versions. 1/16" wire sticking up thru plate is bent at rt. angle on end covered. End fits into washer soldered parallel with 3/32" wire that serves as spring loaded door catch. Spring from ball point pen. Smaller wire protrudes up thru eyelet guide & has wire handle soldered after door is covered. Handle finished w/AL-40, then silver plated. (11) Door covered w/3-ply Strathmore drawing board. Funny thing on door is artist's painting knife — home made by soldering thin brass shim stock to 1/16" m.w., ramming wire into length of 1/2" x 5/8" spruce. Used to cover door handle w/AL-40. (12) Door hinges made by cutting standard hinge half in two. Model used 00 90 bolts and nuts with ends clipped off. Alternate method is to use straight pin in place of bolt, clip to length & smack end of pin lengthwise with a punch such as the finish nail set shown.

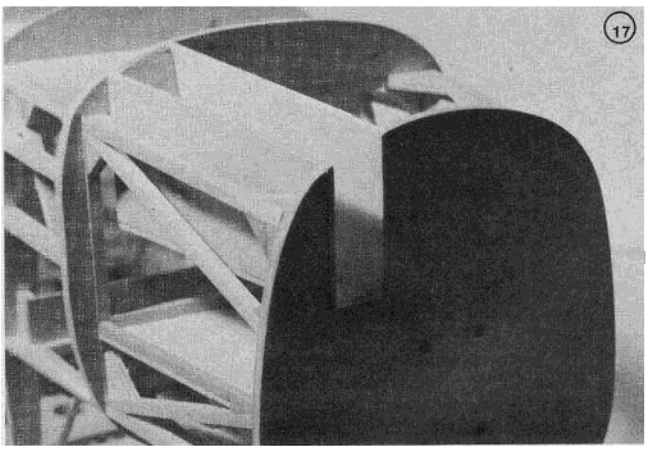


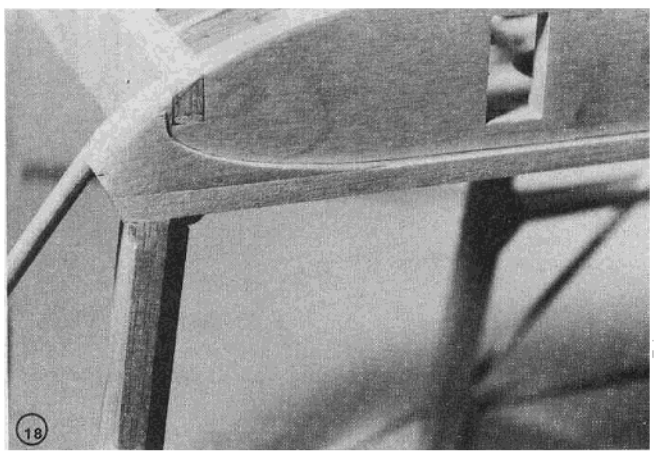




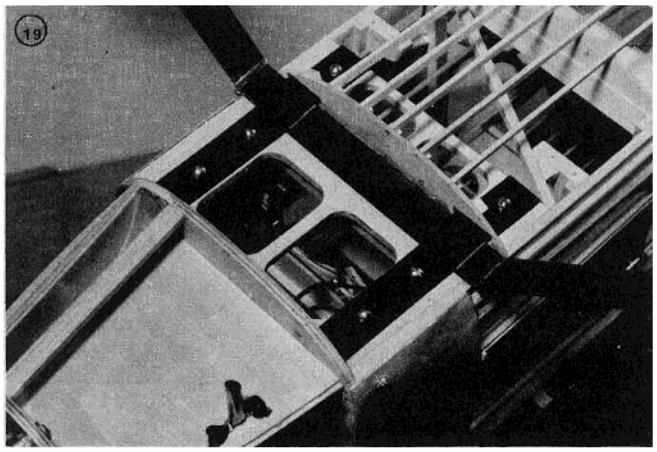


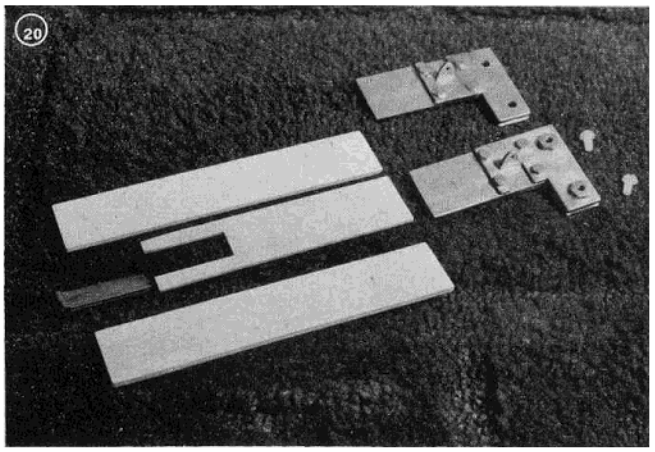


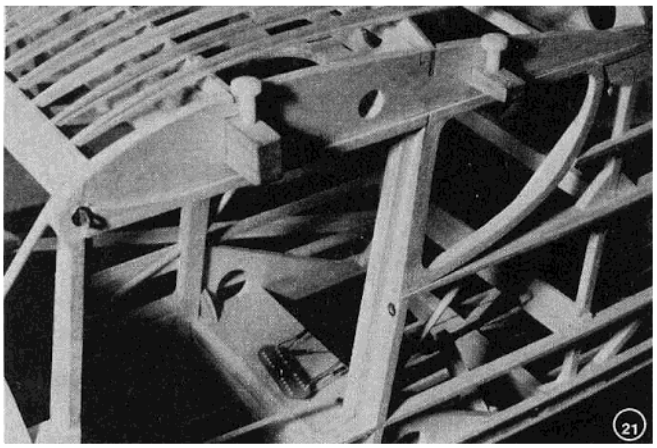


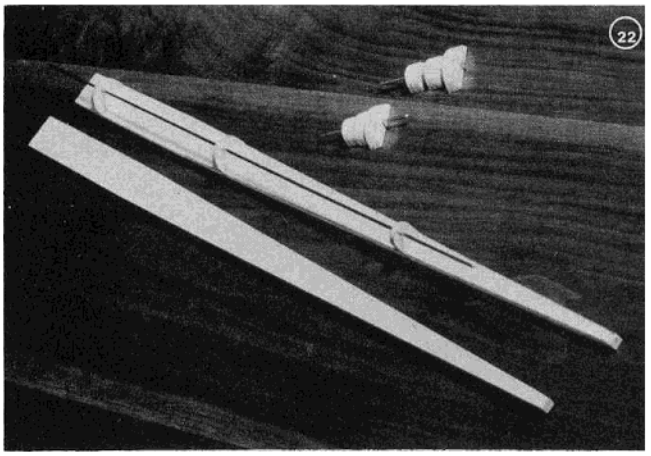


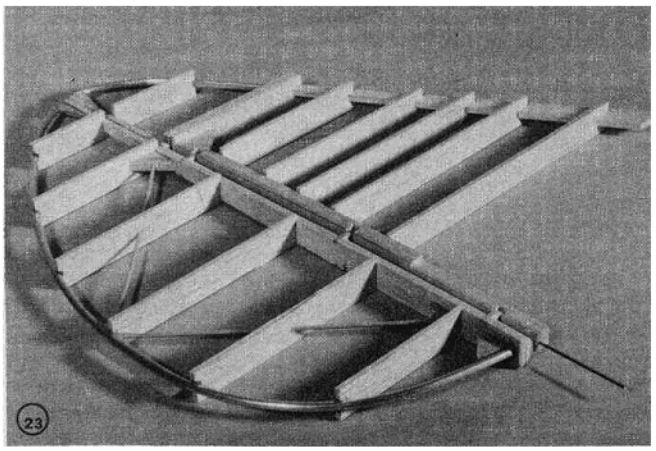
(13) Door is taped firmly, hinge positions marked, & frame & door notched to receive hinges. 1/2" pins forced in w/epoxy. Curvature of door & frame leave gap at this position, but door fits snugly when closed. Note raised door sill over scale position at lower level. This to clear all controls, radio, etc. (14) Top coaming installed around the 2 windshield braces. Braces are 3/16" dowels, Titebonded top, epoxied bottom. Tank held in by aluminum strap. Vinyl seating tape on underside of strap for non-skid performance. (15) 6 oz. bottle of Titebond can get lost in a place like this. Brass strip on upright to left of bottle is screwed & epoxied in. Top is drilled to receive LG mount bolt & nut seen at far upper left. White strip on upright is half-round plastostruct. Antenna runs thru to top of fuse & back. Antenna plug on opposite side. Radio has 3½" wire to plug. (16) Control center mounted in bottom of fuse. Upright piece hooked to pushrod to elev. L.G. clips serve as hinge point. Horizontal bar made from printed circuit board for rudder & tail wheel cables. Wheel collar acts as bearing. Duro "Magic Black Rubber" used on all nuts for vibration. Servos connected w/short lengths of 1/16" m.w. Behind control center is the elev. pushrod supports — ply unit in center holds tube rigid near control center. At all pass-thru points, tube is wrapped w/masking tape & epoxied. Epoxy alone on tube does not hold. (17) Exhaust/cooling tunnel made of "Liteply" (Sig). On full size ship, cowling slotted & exhaust stacks exit. Moved from rt. side to accommodate Max .80, this unit pulls air from front cowl over engine & out. Exhaust from Max fires straight down. Non-restrictive dummy pipes mounted to add touch of realism. (18) Balsa pieces glued to areas where windshield would fit, & the length directly above door; eases windshield fit. Note that wing mount stubs are still not in.

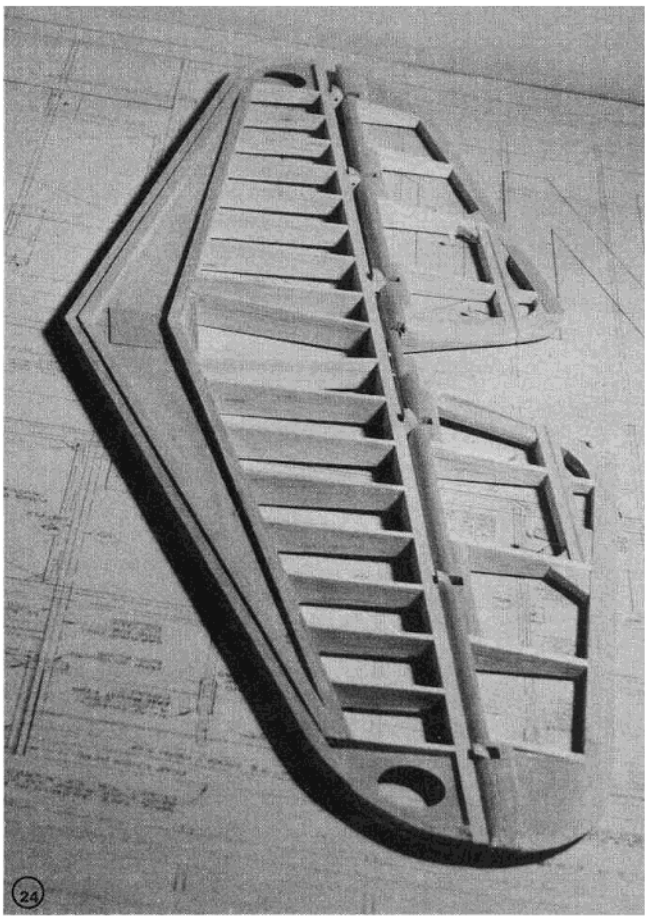




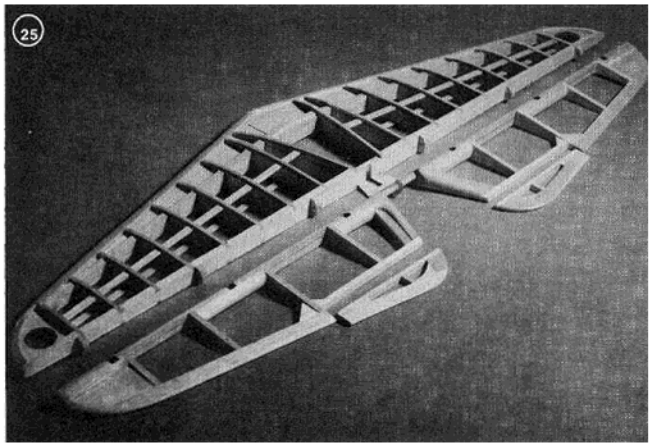


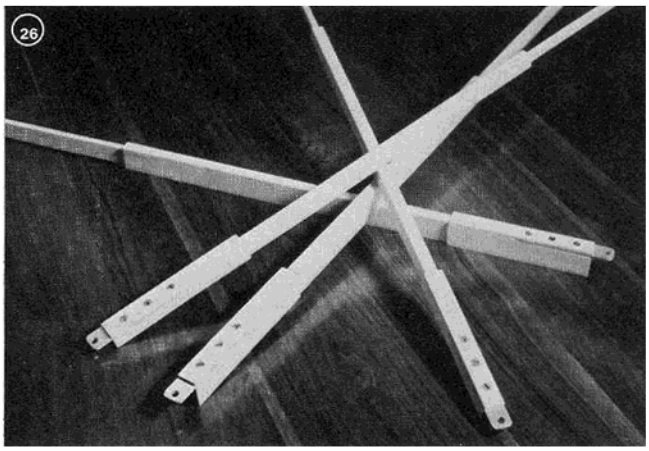


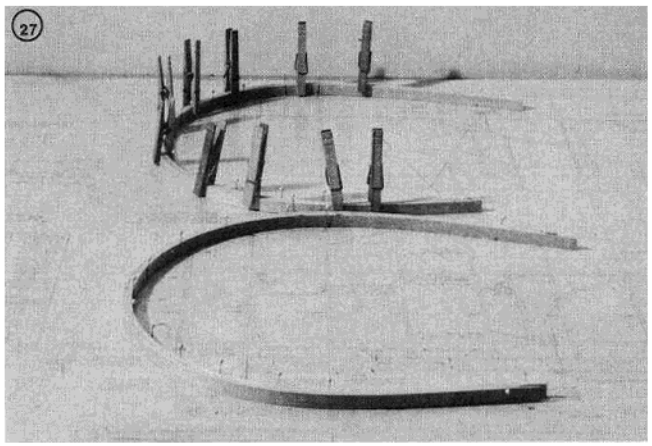


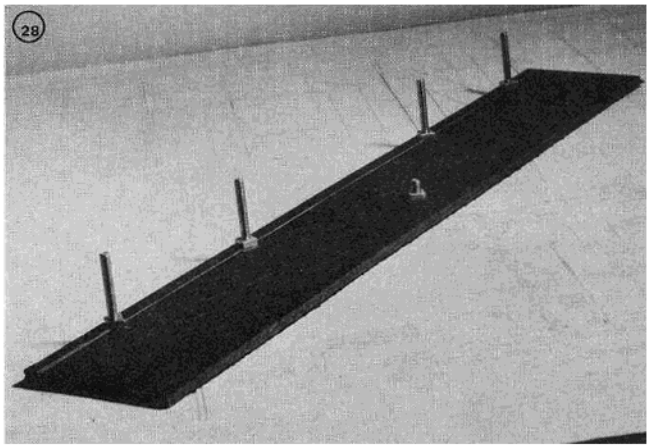


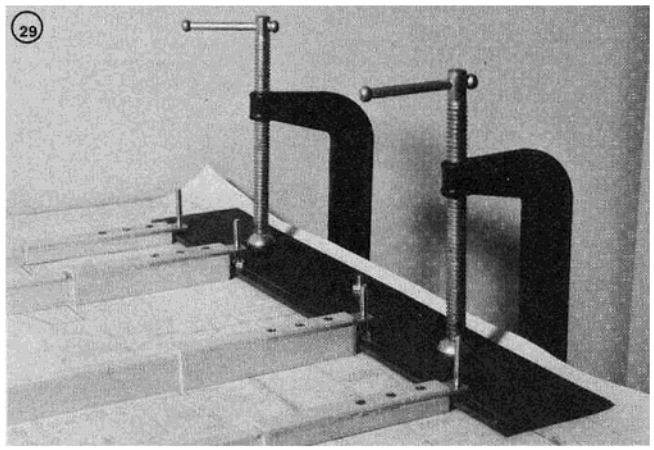
(19) L.G. mounted w/torsion straps. Just aft of the straps are 2 mounts for steps. Pipe at lower left of center is fuel overflow. (20) L.G. strut components; these make up the unit that extends outward to connect to the 2 wing struts. They may appear difficult on plans, but are simple to make. Brass end plates are sandwiched into ply pieces shown. Both brass L end plates are shown to illustrate top & bottom views of a part. (21) Wing mount stubs glued in place, top stringers on. Note that stringers are laminated of spruce below, balsa on top, both 1/8" sq. Wing mount bolts are 1/4 x 20 nylon w/lower ends slotted for easy removal. Note eyelet mounted in rear door frame — serves as catch for door lock. All window frames are recessed to receive plastic windows. (22) Rudder spars & elev. hinges. Rudder built on plans w/tapered spar, section with hinges glued on after removal from board; assures precise alignment of surfaces. (23) Rudder is built flat of strip stock. Razor plane & sanding blocks used to shape rib sections. Simple & accurate. Hinge wire runs up through alum. tube buried in balsa sandwich of fin post. Lower end of wire curved & tucked into tail wheel housing — simulates position light wiring on true Fairchild. (24) Elevator — all rib blanks cut to match spars front & rear, capstrips run over front spar & into meet L.E. Perfect alignment on tapered sections — & no rotten ribs to cut out! Trim tabs mounted w/two pieces of 1/16" thick alum. & are usable if needed for permanent trim.

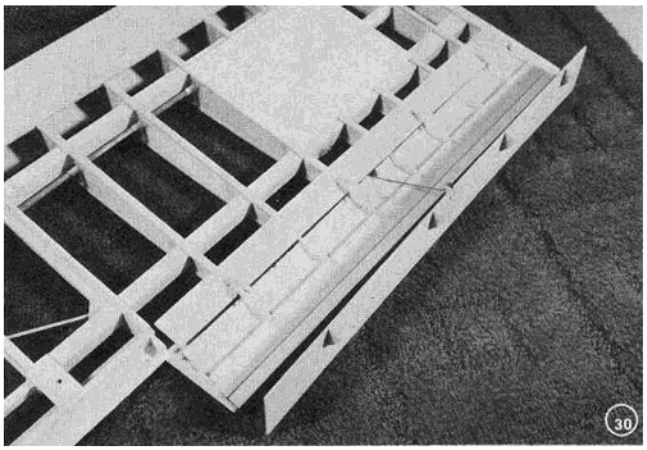




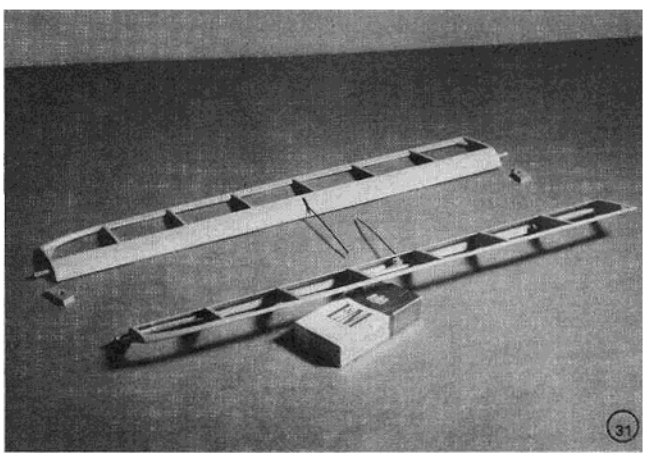


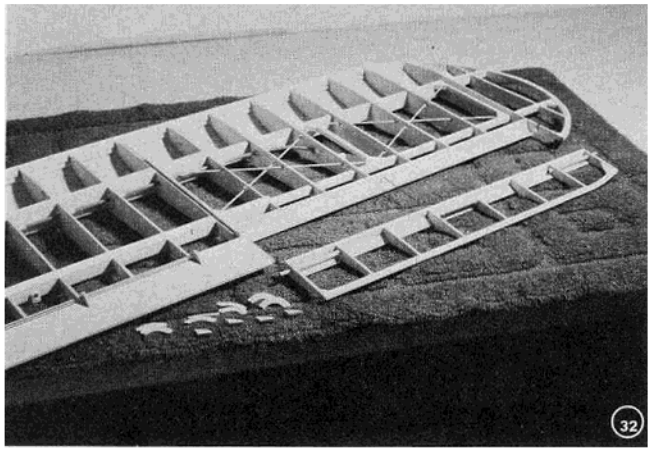


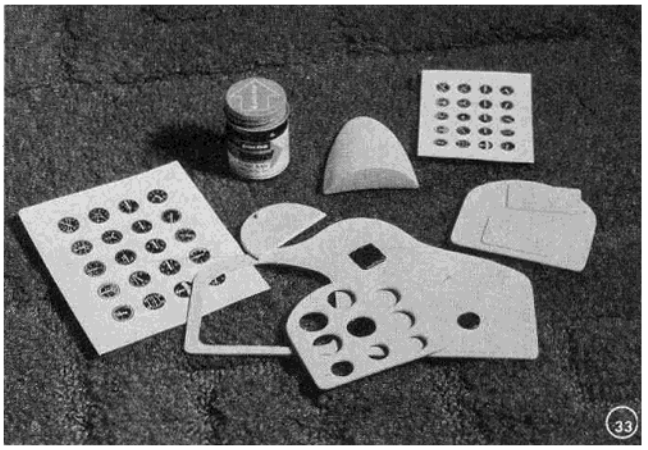


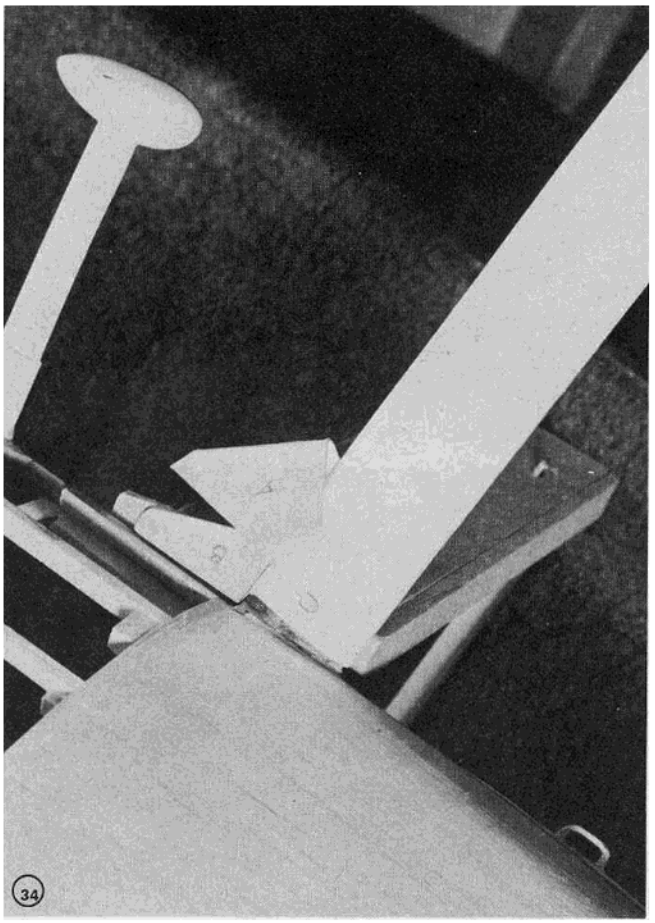


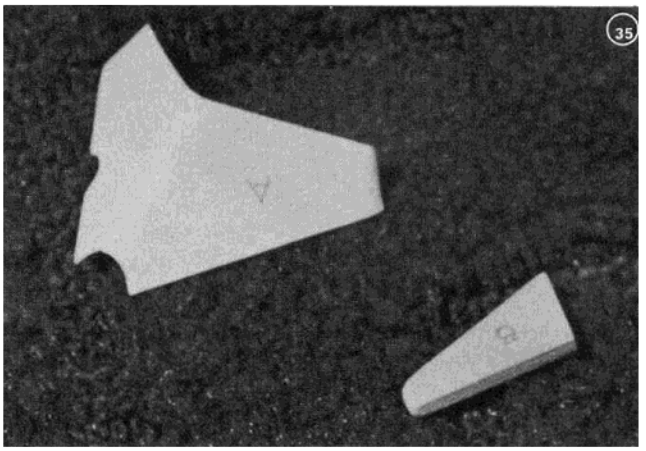
(25) Flat center top & bottom spars have been added to elev. & 1/8" sq. caps run over to form a perfect tapered unit. Bottom of fishtail installed & elev. is ready to be glued into slot at rear of fuse. (26) Assembled spars. Spars are made up from laminates of spruce & maple. Alum. bar is sandwiched in at large end. Screws run down thru spruce, alum. & end in maple — strong! Wing bolts to plane ala the full scale ship. (27) Wing tips built up from 36" long strips of 1/16" balsa joined w/Titebond; wrapped around pins over plan with clothespins while glue dries. Far stronger than cut balsa tips, the units are cut down to fit after 24 hours of drying. (28) Wing building alignment jig made from scrap of 1/4" masonite and 1/4 x 20 bolts. Center lines of spars & attach holes drawn on masonite to be drilled and fitted w/bolts. Spars dropped on bolts & wings built over plans. Small bolt serves as leveler for jig. (29) Wing building jig clamped to building board w/assembled spars in place over alignment bolts. (30) Wing at flap area showing the off-center hinges installed. Flap is sitting on edge. Installed, flaps rotate downward 80°, although scale throw of 60° maximum is used. Box section carries 2 servos (each wing) for flap & aileron. Rear wing strut attach is at lower left. (31) Ailerons, showing internal horns. If using this method, run alum. tube full length to avoid buckling tendency. Slight bend in aileron obliterates pushrod action. Model finished with small external horns. Blocks shown hold aileron in place in wing — aileron must be covered prior to installation.

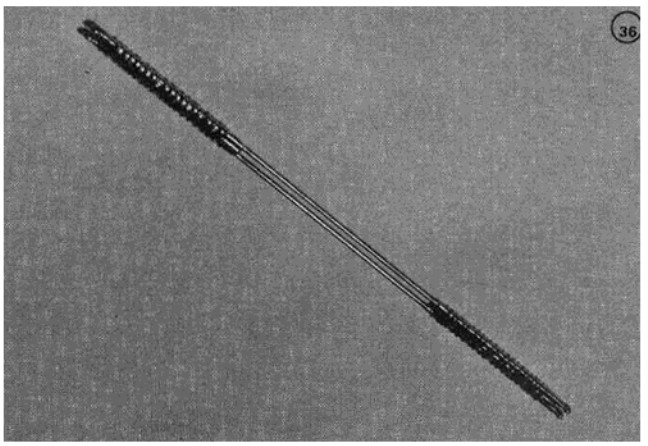


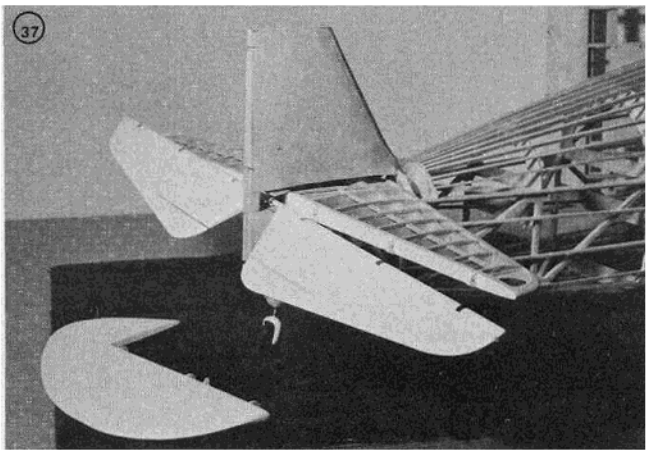




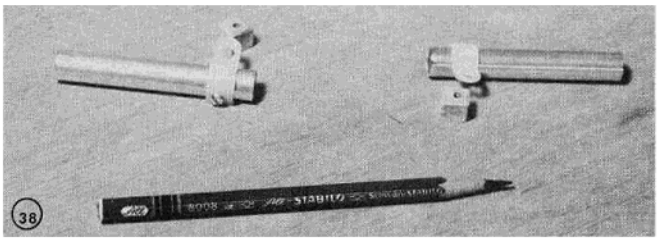








(32) Wing, showing aileron, mounting tubes, & components that go to make up the off-center flap hinges. These made from modified bellcranks, fit on each side of wing ribs & have small 1/8" ply spacers between on the exterior lower wing surface. Flap w/hinge plates is sitting in position. Bent tube aileron drive was torn out after tubing proved to have slop. (33) Dash parts were made of a combination of available instrument faces mounted in a Structo-Plast housing panel cemented to a ply instrument panel. Whole ensem, as well as "dome" forward of panel & area under windshield, finished w/Pactra flat black enamel . . . also used for entire cabin interior. Dash knobs were turned out of artists push pins. (34) Main gear covered w/Strathmore, and gear fairing parts ready to be glued. Plane on its back, shot taken from above, between gear legs. Step unit is to left. (35) Ala the real plane, these 2 units fit at upper end of L.G. to form a fairing. Small part is from spruce, large bent piece is 3 ply Strathmore — it paints beautifully, loves MonoKote. (36) Float attachment — unit is in the ship built, just in case an urge to go to sea arises. Floats scale up at 49½" long, so urge may die. 1/16" cotter pins are soldered into brass tubes, tubes bound together & soldered with 1/16" m.w. spacers. (37) Stab is glued into position & sheeted. Elevator must go into slot at this time too . . . no way to get it in later. Hinge wire is not installed until later, after sheeting and "fishtail" are completed.



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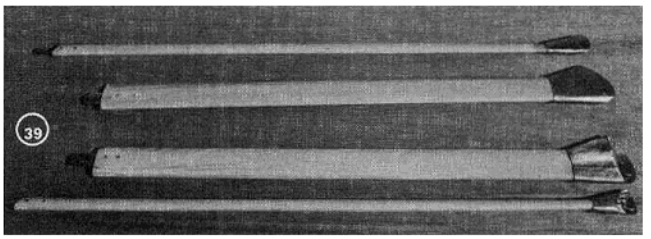

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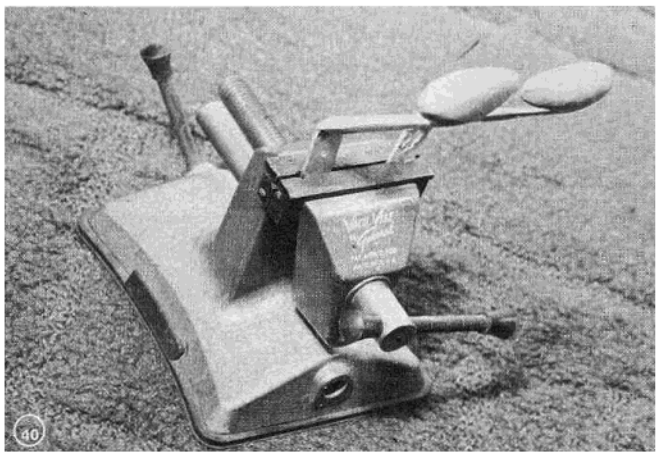

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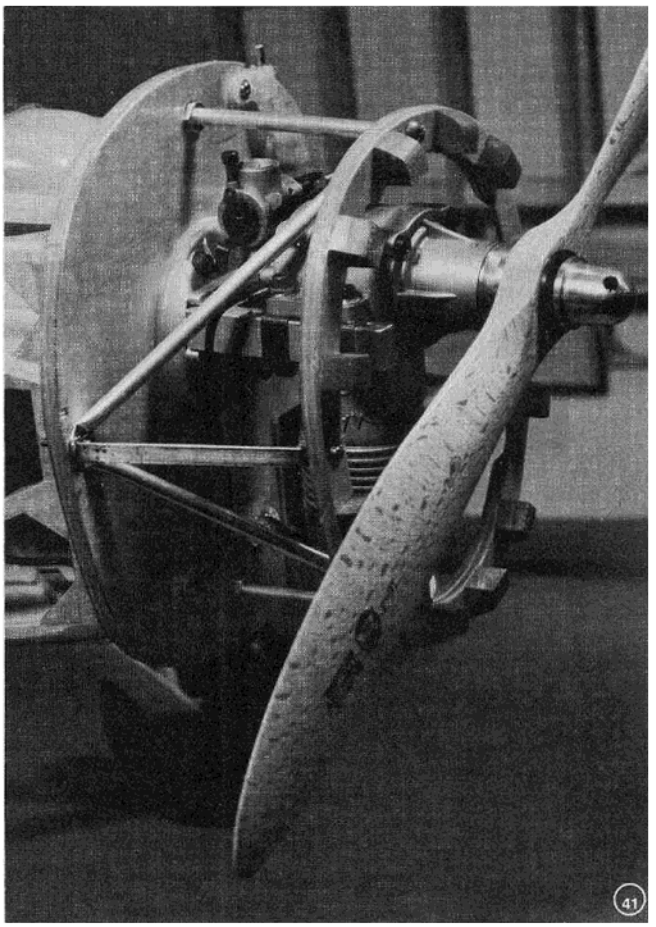

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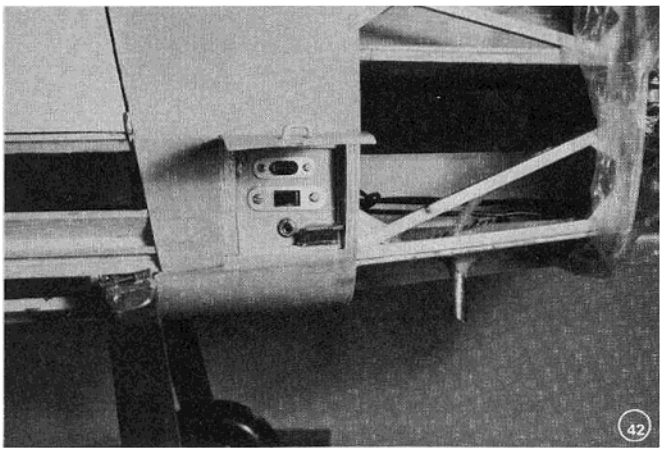

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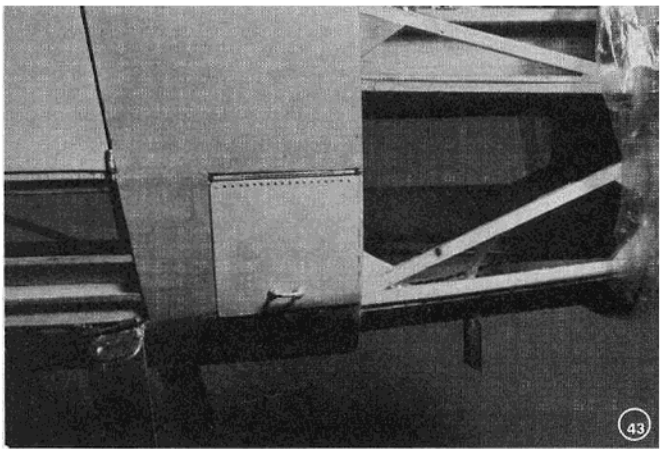

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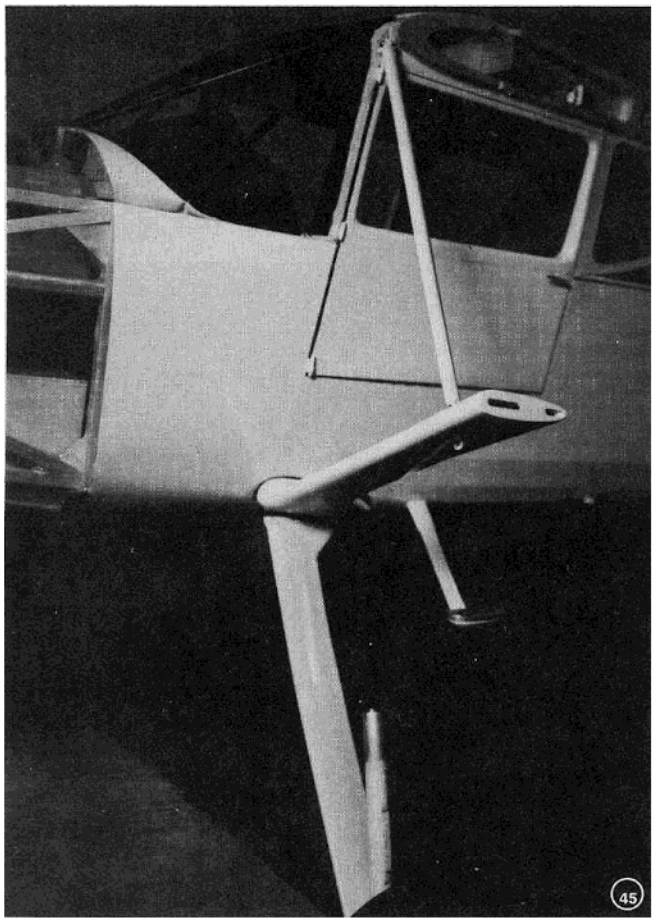
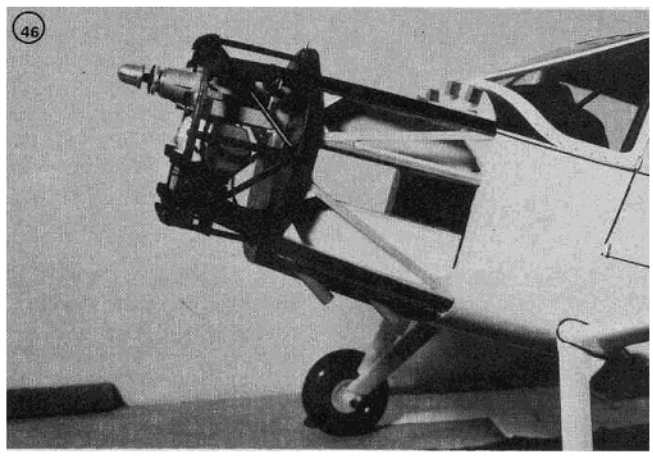
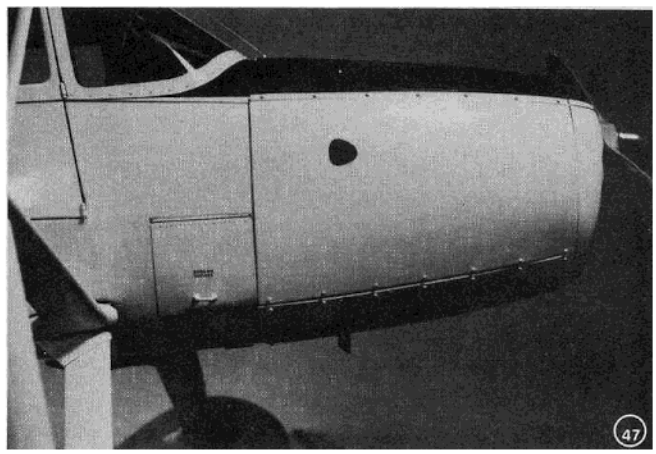
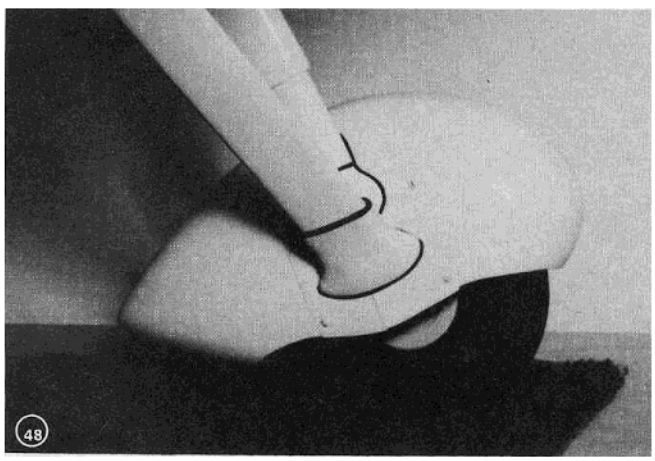
(38) Dummy exhaust pipes made from 7/16" brass tube, painted a flat grey, & drops of red to simulate real pipes. Butyrate wiring harness clip cut in half and fastened to tube w/sheet metal screw. 2/56 bolt w/washer thru clip & block shown hold each to wall of exhaust/cooling tunnel. Stabilo pencil used to mark. (39) Wing struts ready to prime & paint. Ends to the right have alum. fairings installed — double "dots" showing at left ends are 1/8" dowels that hold end fittings in place. Units made of spruce sandwiched w/Titebond & epoxy. (40) Step assemblies in early stage. Dural struts epoxied to ply step & form built up with Epoxolite. Top of step is made from 1/8" thick alum., grooved to partially imitate full scale plane which had grooves and Fairchild logo. Wet or Dry paper cemented in place would duplicate most steps on planes of this era. (41) The engine room — all starting wiring is internal. Ground wire can be seen here attached to Edson motor mount. Bracing adds a lot of strength to cowl ring. Maple blocks around cowl ring protect and seat front cowling — not shown on plans. All nuts used in this area have nylon inserts for vibration. (42) Ground service access — door made of .040 alum., contoured to shape of fuse. Steel plate epoxied to inside, grips magnet at lower right of opening to stay closed. Scissors spring holds door open for charging, top plug; switch, middle; battery plug-in to engine, lower. (43) Ground service access door closed — rivets are obvious. Sig rivets used thru holes in printer's offset plate wrapped around 1/16" m.w. imbedded in fuse. Hinge sections made by slicing w/X-Acto knife. Handle made of 1/16" m.w. wire w/solder build-up around washers outside, solder blobs inside. (44) Landing gear components at the fitting stage. Cabin interior has been painted black, along with area in front of windshield. Baggie on to keep the Max .80 clean.









(45) Detail of wing strut fitting, w/upper strut fitted in place. Spring & top of main oleo yet to be installed. "Rubber" cuff at fuse end of wing strut fitting is actually bell wire epoxied in place around strut. (46) Engine area supports painted black to avoid "peek thru" around cowling sections. Phony exhaust pipes have been painted and mounted. Butyrate clips make them immune to breaking off. Tatone manifold on Max .80 is loosely stuffed with Chore Girl to become highly effective muffler. Pins in windshield help hold ABS over butyrate, with R/C 56 as main adhesive. Tube at top of firewall is fuel fill to tank. (47) Ship was placed in sun on 80° day with doors closed and cowling on — temp inside went to 117°. Hole shown was made & ship again placed in same temp setting — thermometer went to 97°. Outlet fairing used to cover hole ala the full size ship. Cowling shown was made in 5 sections. (48) Wheelpant is made of fiberglass. Closure panel & strut fairings made of .030 ABS, oven molded over forms carved from balsa. DJ Multi-stripe was used to simulate the rubber cuffs on the real plane. Fairings are not scale, but only a Fairchild fanatic would know for sure.

upper landing gear strut to the fuselage at the front of the cabin, when the cotter pins leaped out at me. I used them at the float attach point in case I get daft enough to build a set of floats for the monster. (Floats for this ship scale-up to be 49½" long!) Cotter pins match the inside diameter of the brass tubing we use, and they are tough enough to act as mount points for almost anything, if used in the right size. Mounting two side by side gives an almost exact copy of full size attach points. Space them right and a third will fit between them exactly to carry a strut, or whatever.

If you decide to build the plane, remember to put the tailwheel cables in with a slight bit of slack in them. Make the cables tight and the wheel will not turn. I put them in tight and found out; I also put them in as spring loaded units, and while I could turn the control bar up front, the tail wheel didn't move a fraction of an inch. The reason, of course, is the slant of the tubes — tension on the inner one locks it against the outer. And, no, lubricant doesn't solve it. I used silicone and it stuck fast with the cables tight.

Should you consider lightening the tail by reducing any of the structure, don't. The Fairchild hangs slightly nose down on a balance test, just the way it should. No weight was added to the nose to achieve this, and it's one of the reasons the ship was considered in the hassle over what would make a good, big, fun ship. That long nose works for you.

While on the subject of the nose, the photos show braces not shown on the plans. These are the diagonals that run around to catch the cowl ring where the standoff bolts are anchored. I considered adding them to the plans, but they are each a slightly different length, and I suspect that each plane built would require differing lengths. I used 1/4" aluminum tubing to make them, flattening both ends and drilling them to accept the bolts. The entire airplane can be picked up by the cowl ring, and no amount of trying will see it twist. While aircraft type nuts with nylon inserts were used on all bolts in the nose area, they were safetied with Duro Plastic Black rubber, as were nuts in the landing gear system, the control center, and anywhere else the nut was out of view when

the ship was completed. Only a wrench will work to undo a nut safetied with this product.

Another item not shown on the plans is a gillhooley added during the writing of this article. This is the ram-air carburetion and, while all that sounds like speed shop talk, the ram-air was achieved very simply. The original Fairchilds had all sorts of air openings in the front of the cowl and, on the models, I used the upper oval opening to fit in a funnel made of brass shim stock. The front of the funnel fits the oval exactly, while the back end is perfectly round. Into this rear opening I fit a length of 1/2" diameter vinyl tubing which, in turn, curves up and back to pass over the carburetor opening. A square slot was cut in the portion over the carb, and the remaining length past the carb was plugged with 1/2" length of 3/8" dowel, held in with Duro Plastic Rubber. There is no way that carb can sit back and complain that it's starved for air.

I promised a word about the flap hinges. These were made from aileron bellcranks — 16 of them. The elbow was cut off at the mounting hole and each was sanded round at this point. Two are used at each hinge point, one on each side of a wing rib, with a bolt through, and plenty of epoxy over bolt, hinge, rib, and nut. Just as with the engine having been installed, and all worked to fit around it, and the announcement made about the wealth of new engine reduction units, so it was that after cutting these 16 bellcranks to shape, someone put off-center hinges on the market. Story of my life. However, the cranks aren't all that hard to alter, and you might try what I did — sand them on a Black and Decker rubber sanding cone fitted onto my Dremel jig saw. A great product, it consists of grit of some sort imbedded in rubber. It cuts at the right rate of knots for modelers, and gives a very smooth finish at the same time. Do the nylon cranks in light touches to avoid the melting that occurs when nylon gets hot.

The wings are, admittedly, built up in a rather strange manner, and appear pretty weak if one studies the plans. They are weak . . . until the cap strips go on . . . then they become tremendously strong. In designing the structure, I decided that the balsa ribs should be nothing more than what they actually are — pulp to form a shape. The spruce cap strips inboard convert the pulp to brute strength, just as the balsa caps at the outer section do enough to the ribs out there to make them more than adequatley strong.

If you look carefully at all the funny pictures, you'll notice a shot of the simple jig made to lock the spars into position for building. This worked like a charm. When the wings came up from the building board, I nervously approached the fuselage and tried them out for fit. Viola! (Nuts to the French — I prefer Viola.) I admit that I had to touch up one of the holes with a needle file to achieve a perfect fit, but this was nothing like some of the nightmares encountered with kits that use wires fitted into tubes, such as a glider normally uses. I'm a fairly careful builder, but I've yet to build a sailplane kit where the wires exactly matched the plug-in points.

This brings up the business of accurate transfer of part shape from plan to wood. Another artist's trick, aside from cutting the part out of the plan and rubber cementing it to the wood and cutting around the line, is to blacken the back of the plan with a #1 or #2 broad or flat lead pencil. Art stores have them, and carpenters use a variation to mark lumber for cutting. Next, take a cotton ball or a wadded facial tissue, and soak it with rubbing alcohol. Rub this over the pencil markings and you have instant, non-smear "carbon paper", like the original carbon paper of years ago. Some experimentation with a scrap of paper and a standard lead pencil will show you how simple and easy this is. Using commercial carbon paper is a worthless pursuit — the results are never accurate. On the same thought train, should you wish to trace something onto a dark surface, use white chalk, or better, a pastel stick on the back of the drawing to be traced. Rub the chalk or pastel out to a smooth finish with your fingers, blow off the excess dust, turn over and trace it down. In the case of the pencil technique, should you wish to remove the traced down line, do it with alcohol. With the chalk or pastel, use your finger, or a dampened facial tissue. Both of these methods work in marking Mono-Kote for cutting out design shapes.

On the first flight, test pilot, Bob Karlsson, decided that the ship was so sure footed that he began a series of low passes to wahoo the field. Only correction made was a slight bit of aileron trim.

The plans show one method of installing the internal wiring, while I used yet another, as shown in the pictures. You will notice variances in the plans and the finished product, and even places on the plans where two alternatives are often shown for a specific bit of construction. Either way works; I simply note the varying methods on my plans and often choose yet another way in the final construction.

The idea of using the various pipes that hang down out of the full scale ship as connections for the starting wiring is valid, but another idea popped up during the construction: put all the electrical gizmos in one place and cover them with a door to keep them clean. Since I'd puzzled out the manner of fast loading on the Show Team's drop ship, which had to take-off, drop, land, reload, etc., 4 times in 10 minutes, I used the same fastening on this door as on the J-3 built for the Team . . . parts from a magnetic cabinet door catch. The magnet is mounted in a corner of the door frame, and the metal "grab plate" is epoxied to the aluminum door. The only disadvantage I see to this whole scheme is that, if the plane lands far away and the usual eager little kid runs out to retrieve it, he'll never find the switch. It's under that door, too, but then no little kid would ever be able to lug jumbo back either.

Something else not shown on the plans is a tube, made of rolled three ply Strathmore, that runs from the servo box in the wing, out through the root rib. This allows the servo wires to be fed in and out without hanging up on a rib. Extension wires were made up for the servos for the distance from box to root rib, and extension "Y" harnesses were made by Kraft to get the wiring long enough to run down the door frames and forward to the radio. The Y's were required to split the commands up to handle the two servos in each wing.

Two methods of elevator construction are shown, but the easiest is to cut the spars and leading edge parts to exact shape, pin to the plan with the ends blocked to level, then glue over-size strips between in the rib positions. After

this comes off the board, simply cut the ribs to match the spar thickness. This gives an absolutely true tapered structure. The cap strips are added over the lengthwise strips to obtain the airfoil top and bottom. The rudder is built in the same manner, as is the vertical stab, with the only exception being that notches are cut for the leading and trailing edges. I've been building this way for years, but since no one in this area had heard of it, I pass it along here.

I considered making the entire tail assembly removable by running a bolt up through the bottom of the fuselage to hold it in place, but finally settled on gluing the whole ensem rigidly in place, which meant building part of it as the basics sat on the plane. The "fishtail" had me a bit concerned initially, but it went together very easily. If you build the ship and attach the rudder and elevator as I did, just remember that the elevator must be covered before it is mounted with the horizontal stab . . . and it **must** be mounted with the stab. No way to get it in once the stab is glued in place.

As mentioned previously, the ship was built in an apartment, which ruled out dope. So, the covering in MonoKote — whole bunches of it. (The local hobby shop owner has erected a shrine in my name and the name of Fairchild.) Painted areas are the horizontal and vertical stabs, and the doors, cowling parts, struts, and landing gear. I grew up on dope as an aircraft finish, and I still prefer it over all the new miracles that people have put in cans to frustrate people like me.

I tried K & B Super Poxy on the tail surfaces, but it dries too slowly for compatibility with a shag-carpeted apartment. It is also too white for MonoKote white, which has a slight ochre cast. Too, I wasn't too pleased with the complete lack of directions, and failure to mention that they had two catalysts, brushing and spraying, nor the 12-hour set-up time before the stuff could be rubbed down . . . and through. I switched to "Perfect Paint" and had much better luck, although this stuff stays soft, too, for quite some time. Perfect Paint was a better match for the MonoKote and it set up dust free faster than the Super Poxy. It also, as a polyurethane, can be used to touch up those inevitable marks in MonoKote that slobs like me always manage to make.

In doing the gold trim striping around the blue color panels, I, of course, ran out of 1/16" width D & J striping, and naturally my shrine builder had no more in stock. Back to the artist's bag of tricks — I used a gadget that's known in studios as a railroad cutter. It's simply a razor knife with two blades that can be adjusted to varying widths to cut strips of almost anything, including gold MonoKote trim sheets to 1/16" and the 1/32" thickness I needed for the striping around the numbers of the rudder. While this cutting of your own striping works very well, you can't top the D & J for going around in intricate curves, such as the ones on the wheel pants. MonoKote would never have made it around the bends . . . through the pass, yes, but never the bends.

That's enough of the drivel to do with all the funnies of the building and finishing. As mentioned previously, the plans are a full construction article by themselves, so, moving right along . . . let's switch the scene to the flying field.

Before we go off to the field, I should mention that half the "partnership" on this project had developed a severe case of chicken feathers. Carl Cantera, who was to be the pilot in this first attempt at the Innovator's Class, got his first look at the monster and made a snap decision — "I haven't flown anything in over 200 years, so I'm too rusty to tangle with that thing". We decided that Bob Karlsson, a consistent scale flier, would be our patsy, er, test pilot.

The Summer of '77 was anything but a neat affair, especially on the eastern seaboard. Heat that would melt the doorknobs on a brass monastery (fooled you, didn't I?) and humidity that oozed through the air in greasy formations . . . all mixed with nasty thunderstorms. One weekend after another slithered by with no flight tests, and I was determined that there would be flight tests **before** this article went off to Don Dewey. I suspected that Dewey had lost all faith in me anyway, since this whole project had been promised for almost a year. But, I, for one, am a tad tired of all the articles about planes that have never left the ground. This article was to include flight shots . . . or the whole idea got scrapped.

We finally lucked out and had a decent weekend in late August, and Karlsson and I met at a flying site in Lum's Pond State Park, just south of Newark, Delaware, at a very early hour. Site of the Delaware R/C Club's flying field, there was no one there but we two, three groundhogs, a gaggle of rabbits, and a lot of freshly cut wet grass.

I'd installed a 16/4 AMF prop (seen in all the photos), but my test pilot was all sneers about this item. "Never deliver. What we need is what a Max .80 loves — a 14/6." That Max will never rev with that dumb thing you did all the fancy decorations on." He installed his 14/6, while I installed my gear . . . a ground anchor one uses for pets. This latter was coupled with a short length of cable with a ring, which fit onto a small fisherman's pocket scale of 8 lb. capacity. The scale had another length of cable that went forward for roughly 2½' to a loop that fit over the strut of the tail wheel. All this gobbledegook was to prove what prop pulled best to develop the most pounds of readable pull on that scale.

After the usual fiddle-dum, fiddle-dee routine with the engine, our test pilot tached the engine and found it topping out at 9000 rpm — a figure he declared he wanted to see from a Max for this size prop, for this size beast. The reading on the fish scale was ranging from 5 to 6 pounds of pull. "How about trying, just for fun, my gaudy natural wood with blue, white, and gold stripes," I suggested. Smirking wisely, our T.P. installed the 16/4, restarted the engine, and lip read me the info that it was only putting out 7000 rpm. He then looked at the scale and found that the pull had yanked the unit to the top of its range . . . indicating a pull in excess of 8 lbs. I'd been holding onto Monstro through the tests, and I didn't need a look at the scale. I **knew** which prop pulled best!

The next test performed consisted of putting the ship, sans wings, out on the take-off area and running it back and forth in sprints to see what kind of inertia the throttle control would relay to the engine. Each burst of called for power had the "Almost A Fairchild" into instant action — no delays of engine or control to rudder. Karlsson announced that the rudder control was instant and finite. The elevator remained untouched at this point, since using it would prove nothing without the wings.

The wings were installed, and Karlsson looked like something out of a Hemingway novel, facing "the moment of truth". I'd told him that if he pranged it, I could care less — if it dinged, it deserved to die anyway. Nonetheless, his take-off run was a bit erratic. He overcontrolled the rudder in his nervousness, but once airborne, he found that there was no need to use the rudder, even for the landing that was to come.

In a later analysis of the test flight, Bob said that the ship was "one beautiful airplane to fly", and that the only correction he had added was a slight bit of right aileron. He also admitted that the throw I'd put in the elevator had scared him, but that, in flight, it was smack on the nose and responded beautifully. So you know, should you wish to build one, throws on the elevator are max up and down, as are those of the ailerons (roughly 20° plus in either direction) and the rudder.

Flaps were given a 60° maximum down ala the full scale ship, and these, according to our test pilot, were on the money. The landing, after a number of **very** low passes, was a classic. The big oleos flex beautifully, and the whole gear system smoothed out a rough field to make the landing look as though done on concrete. The only mishap was a broken strut from the landing; this strut was one of the minor struts that runs from the main strut juncture up to the cabin. It has been replaced with a new strut, as has its mate on the other side, with new ones made of streamlined

brass tubing, 3/8" wide, with brass end fittings as shown on the plans and an inner fitting of a length of birch dowel to stiffen them.

The in-flight shots were made on the first test flight. Other than the strut mentioned, no modifications are required — the thing I find the most satisfying about getting my nose into such a project. After that flight, my interest died. My design and theories had worked; meanwhile, there was this really great crop duster the Grumann Co. had developed that could be redesigned a bit here and there, and maybe some talc could be fitted into a hopper. . . □

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