



## .60-size Texaco Special



LOCKHEED VEGA

# AIR EXPRESS



**W**HEN LOCKHEED introduced its all-wood Vega in 1927, it featured a fully enclosed cockpit forward of the five-place passenger bay. Western Air Express placed an order for eight, but specified that Lockheed build them with an open cockpit and a parasol wing. It seems that the WAE pilots were too smart to be trapped inside a warm, cozy cockpit, and having spent my entire life as a pilot, I fully understand. I remember veteran pilots who swore they'd never give up the recips for jets and some who even refused to turn on the weather radar when it became required equipment in the late 1960s.

by P E T E F U S C O

Western Air Express took delivery of only one aircraft, and the rest became available to do what they seemed destined to do from the start: set records. More powerful and faster than the Vegas, the Air Expresses were soon in the hands of the most famous airman of the day, Roscoe Turner. He and his pet lion, Gilmore, flew one in the striking cream, red and gold colors of the Gilmore Oil Co. Mine is the famous "Texaco 5," as flown by Captain Frank Hawks. Hawks set many long-distance records with this ship, but I think most remarkable was his Philadelphia to New York time of 20 minutes in 1929. Twenty minutes would be a good time today in a Boeing 727!

Blame the model version on my buddy Jim Bliss, who has more enthusiasm for this hobby than anyone I know. I mentioned to Jim that if I could find a three-view of the Lockheed Air Express, I'd build a .60-size version for R/C. Jim searched through his voluminous files and mailed me a 1-pound packet of pics and drawings. He had called my bluff. I began to cut wood.

## CONSTRUCTION

Before I begin the construction notes, let me tantalize dedicated scratch-builders by pointing out that Lockheed used the same basic plywood fuselage, wing and tail for the cabin Vegas, parasol Air Expresses and low-wing Sirius, Altairs and Explorers. The same could be done with these plans.

● **Wing.** Building one panel at a time, fit the wing ribs to the two bottom spars. (Don't worry about cutting the top spar notches at this time.) Pin the inboard ends of the spars to your work surface, and block up their outboard ends until the top of rib R-9 is the same height as the top of R-1, which should be resting on the work surface. Square all ribs to the surface and then glue them to the spar. The result will be a wing with a flat top and dihedral on the bottom. This is the scale configuration.

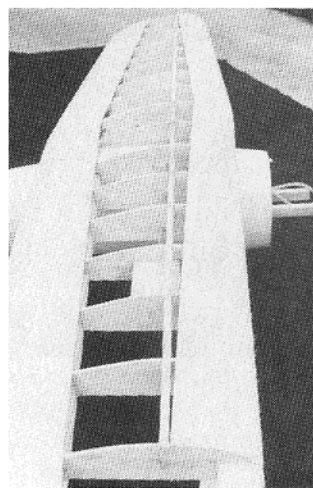
Glue the wing halves and the front and rear dihedral braces to-

gether. The rear brace will have to be cut through about halfway and bent forward slightly. Add the wing tips. Find two pieces of straight 36x4x<sup>3</sup>/<sub>32</sub>-inch balsa, and glue them to the bottom of the

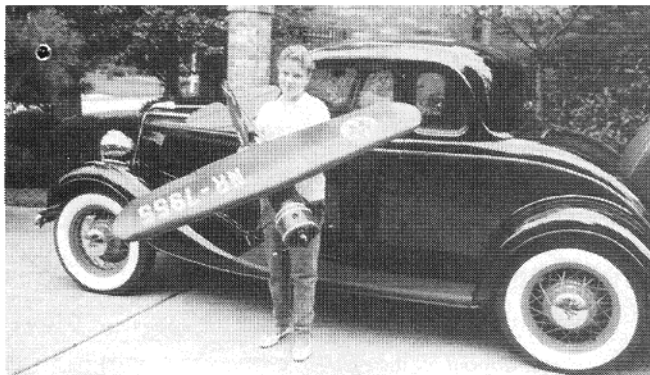
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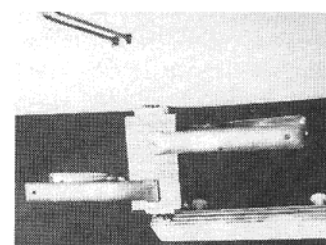
Mark its position, notch it and install the top spar after the top and bottom leading- and trailing-edge sheeting has been applied (makes for a perfect fit).



Author's daughter, Amy, shows off the Air Express in front of a 1934 Ford five-window coupe.

trailing edge, leaving a 7/8-inch overhang on which you'll now glue the 1/2-inch-wide trailing edge. Ready-made trailing-edge stock won't fit the airfoil shape, so you'll have to sand a piece of 1/2x1/4-inch balsa stock to fit. Bend

the end of the sheeting so that it conforms to the wing tip and glue it to the tip. Note: except for the upper front of the wing tip, which requires a shaped block, the sheeting can be coaxed over R-9 and glued to the wing tip with instant



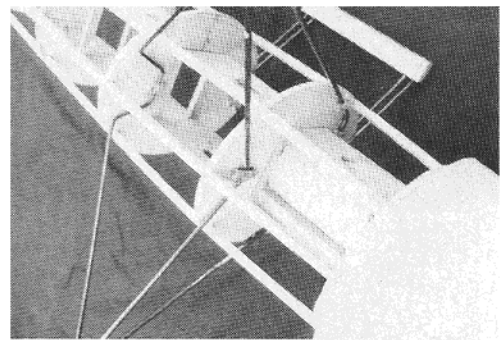
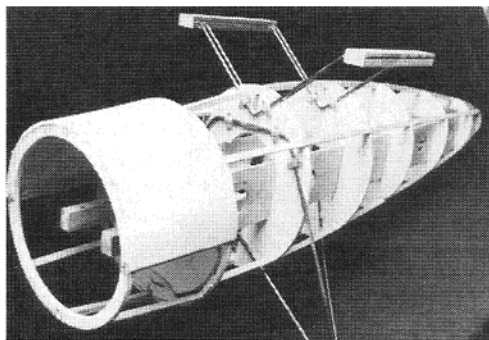
Cabane strut is sandwiched with balsa and clamped until dry before being carved and sanded to an airfoil shape.

**Type:** Sport-scale parasol  
**Wingspan:** 61 inches  
**Wing area:** 629 square inches  
**Length:** 40.5 inches  
**Power req'd:** .60 2-stroke or .90 4-stroke  
**No. of channels req'd:** 4 (rudder, elevator, aileron, throttle)  
**Weight:** 7.5 pounds  
**Wing loading:** Approximately 27.5 ounces per square foot  
**Wing incidence:** 2 degrees positive  
**Stab incidence:** 0 degrees

SPECIFICATIONS

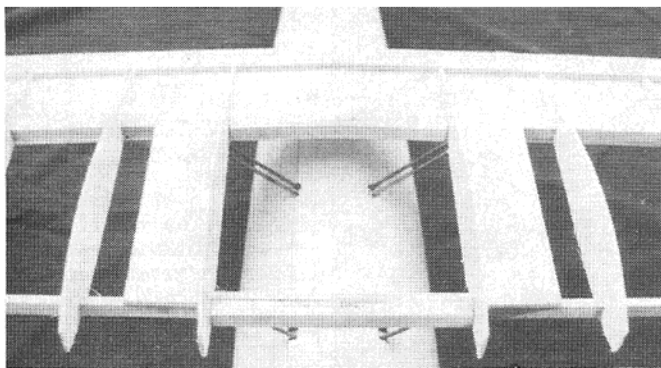
glue (kicker helps). Epoxy the 1/4-inch plywood cabane attachment pieces to the top of the bottom spars, and "snug" them against the outside of R-2. Don't drill the 1/4x20 bolt holes yet.

Mount the control rods and

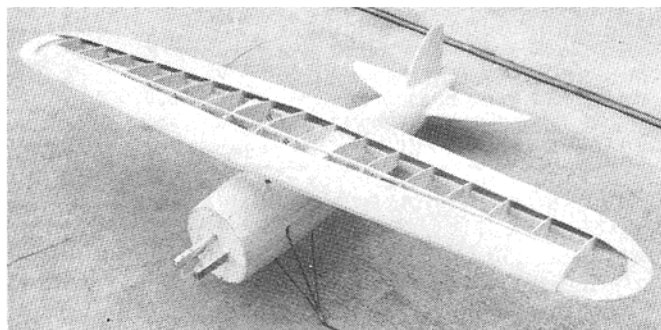


■ Left: fuselage box crutch with formers and stringers installed. Cowl as shown has been partially sheathed. ■ Right: view of fuselage bottom showing gear details. Note the brass fitting that holds the front bottom gear legs in place and allows a little bounce.

# AIR EXPRESS



The wing after it has been fitted to the cabanes. It has been drilled and is held in place by four 1/4-20 nylon bolts.



The fully planked fuselage is shown with the wing attached. The wing-tip blocks have yet to be installed before the final sheeting.

servo in the wing center section. I like bellcranks, as long as everything is secure and play is kept to a minimum. The use of swivel ball links on the rods going from the bellcranks to the ailerons will allow the flexibility you'll need when it's time to attach the linkage to the ailerons. The wing should now be set aside. The leading edge, the top spar and the

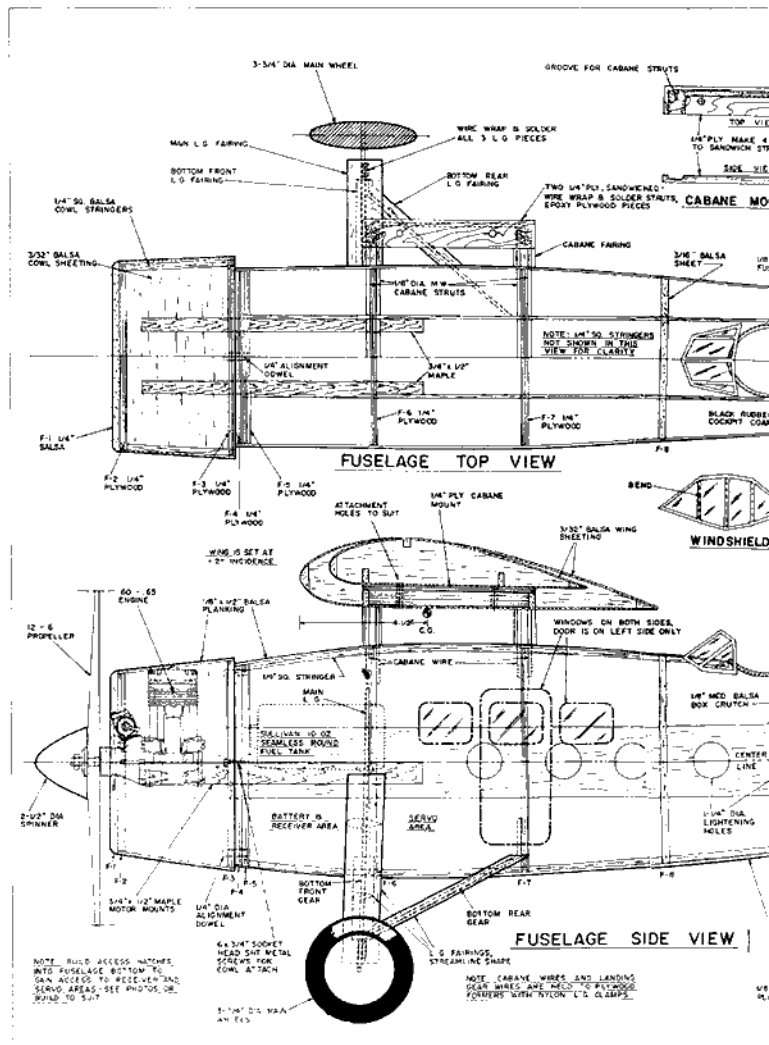
remaining sheeting will be attached after the wing has been fitted to the cabane mounts.

● **Fuselage.** Cut out all the fuselage formers but don't notch them for the stringers. Bend the four cabane wires and mount them on the front and back of formers F-6 and F-7 using nylon landing-gear mounts. Bend the main landing gear and attach it to the front of

## MATERIALS

- 4 sheets 36x4x3/32-inch—wing sheeting
- 8 sheets 36x3x3/32-inch—wing and tail sheeting and wing ribs
- 3 sheets 36x4x1/8-inch—fuselage planking and fuselage crutch
- 4 sheets 36x4x1/4-inch—fuselage formers and wing tips
- 2 sheets 36x3x3/8-inch—tail surface framing
- 2 sheets 36x3x3/16-inch—fuselage formers
- Soft blocks—wing tips, headrest and tail cone
- 4 pieces 36x1/4x1/2-inch—spruce or hard-balsa bottom wing spars
- 8 pieces 36x1/4x1/4-inch—stringers and top spar
- 2 pieces 36x1x1/2-inch—leading edge
- 1 piece 24x12x1/4-inch—five-ply plywood for formers and cabane mounts, etc.
- 5 pieces 36x5/32-inch music wire
- 5 pieces 36x1/8-inch music wire
- 1 piece 36x3/32-inch music wire

(All balsa unless otherwise noted)



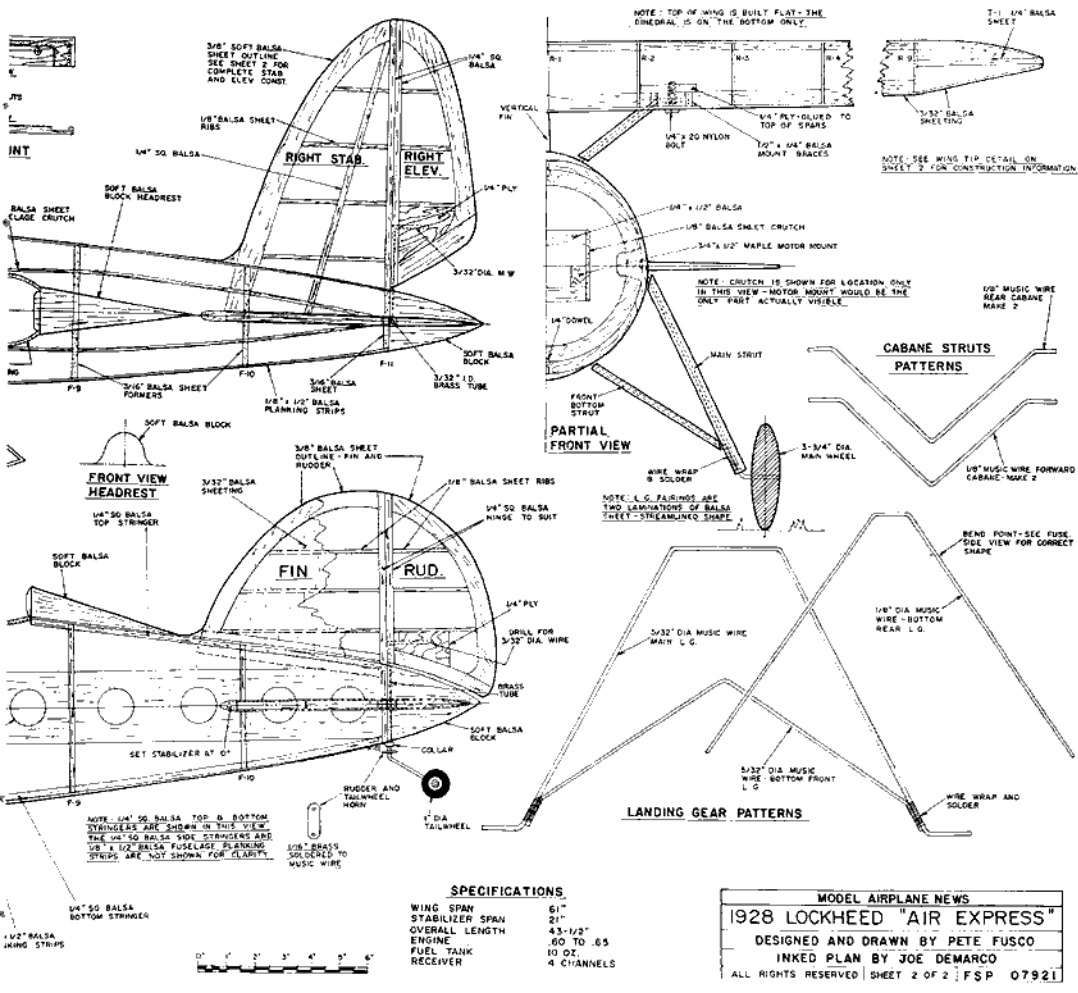
F-6—again, using nylon gear mounts. Build the box crutch and attach all the formers to it. You can use maple beam mounts, as I did, or you can install a radial engine mount on the firewall.

Bend and attach the front and rear bottom landing-gear wires at this time. It's not as hard as it sounds. The idea is to make all three ends on each side meet. Wrap the pieces with thin copper wire, and solder them. (Remember, when you use any kind of silver solder, you don't apply heat to the solder joint directly.) While holding the solder on the joint, heat the wires with a propane torch, keeping the flame an inch or two from the joint. The solder will flow beautifully when the heat is right. The front bottom gear piece rides up and down in a brass slide, as shown. This gives the gear a little bounce.

Fit the wire "U" into the cabane

wires as shown, wrap with wire and solder to the cabane uprights. Cut out the four plywood cabane mounts, groove them to accept the wires and epoxy the pieces together in a sandwich, holding the assembly in strong clamps until the epoxy has dried. Drill the four 1/4-20 bolt holes in the finished cabane mounts. (At this point in the construction, it occurred to me that the difficulty of building the cabanes is why the Air Express has been bypassed by many scale model builders.)

● **Back to the wing.** The wing should slip over the plywood cabane mounts at this point, although it will probably take a little fitting and bending. When everything is lined up, clamp the wing to the plywood cabane mounts at the plywood cabane attachment points, and drill from the bottom up through the pre-drilled holes in the cabanes.



result will be ailerons that look as if they've been cut right out of the wings—which, of course, they were. Remember to install a small piece of plywood inside the aileron for a horn mount.

● **Finishing the fuselage.** Using the positions of the stringer notches on the formers as guides, hold a long piece of 1/4-inch-square balsa in place against the formers, and mark the exact positions of the stringers. Notch the formers and install the stringers. After installing the tank, plank the fuselage—except for the bottom, which should be left open to allow the installation of the control rods and the servo mounts.

Build the cowl and fit it onto the front of F-4, using the two alignment dowels and two socket-head sheet-metal screws. Making the cowl is simply a matter of joining F-2 and F-3 with four pieces of 1/4-inch-square hard balsa in the notches and four more between the formers. Bend pieces of 3/32-inch-thick balsa around the cowl, and glue them to the 1/4-inch-square pieces. Now add F-1 and sand the entire assembly. It's great to have the skills to build a cowl like this, because it opens the door to anything with a round engine.

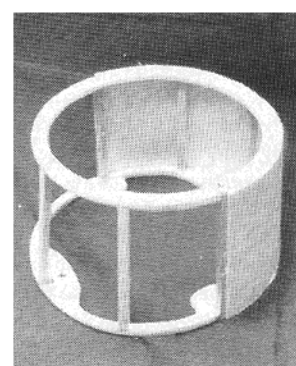
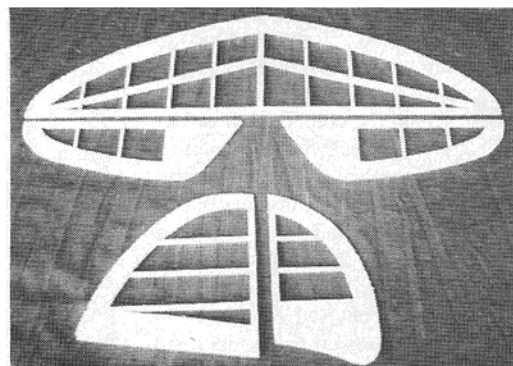
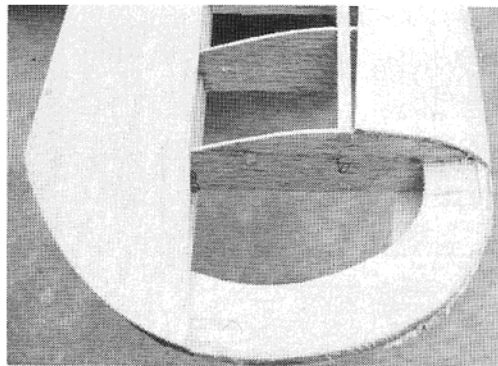
Now that you've mastered round cowls, try your hand at airfoil-shaped struts. I simply glue a piece of balsa that's the same thickness as the wire to the front and back of the wire. (Use a glue like Ambroid because it allows lots of working time and can be

Add the wing leading edge, which is tapered and beveled with a coarse sanding block after it has been attached. Glue on the top trailing-edge sheeting and the top and bottom leading-edge sheeting. Lay a straightedge along the top of the wing, and mark the

position of the top spar. Notch and install the 1/4-inch-square hard-balsa top spar.

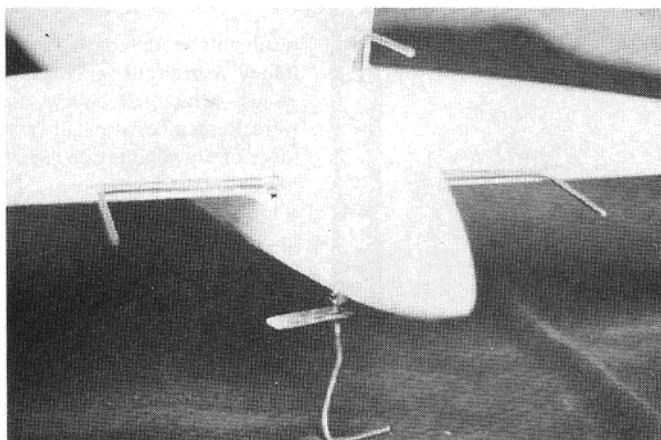
Finish sheeting the wing, making sure you don't sheet over the cabane-mount locations on the bottom of it. Support the bottom sheeting in the wing around the

cabane mounts with some scrap 1/8-inch-thick sheet. Cut the ailerons out of the wing, bevel them on the bottom (according to the plans) and use balsa stock to fill the openings made in the wing and the ailerons. Trial-fitting is the only way to go on this, but the



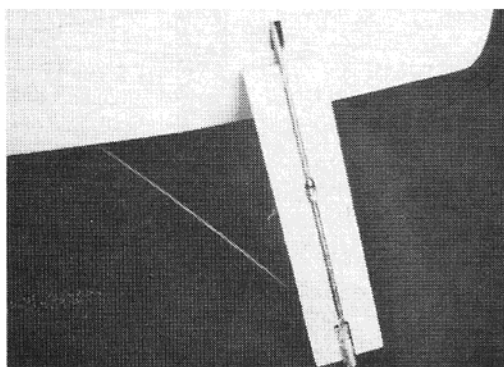
■ Left: a detail of the wing tip before the installation of the top, forward tip. All the other wing sheeting can be coaxied over R-9 and glued to the tip. ■ Middle: the framed tail assemblies before they're sheeted. Note the plywood pieces in the elevators and the bottom of the rudder to accept the 3/32-inch-diameter music wire. ■ Right: half-sheeted cowl. A little ammonia on the outside of the sheet will make it easier to bend. This is a lot easier than making a fiberglass cowl.

PHOTOS BY PETE FUSCO



The aft view showing the combined rudder wire and tail wheel with the brass control horn soldered on. Also shown is the elevator wire, which is installed before the tail cone. (All wire is  $\frac{3}{32}$ -inch-diameter music wire.)

The main landing-gear strut is shown with the first stage of balsa sandwiching. A top and bottom piece will be added. It will then be carved and sanded to airfoil shape—quick, easy and cheap.



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**“The full-size Lockheed Air Expresses are long gone, so why not build your own and put this colorful, historic aircraft back into the sky. It is, after all, a miracle only our hobby will allow.”**

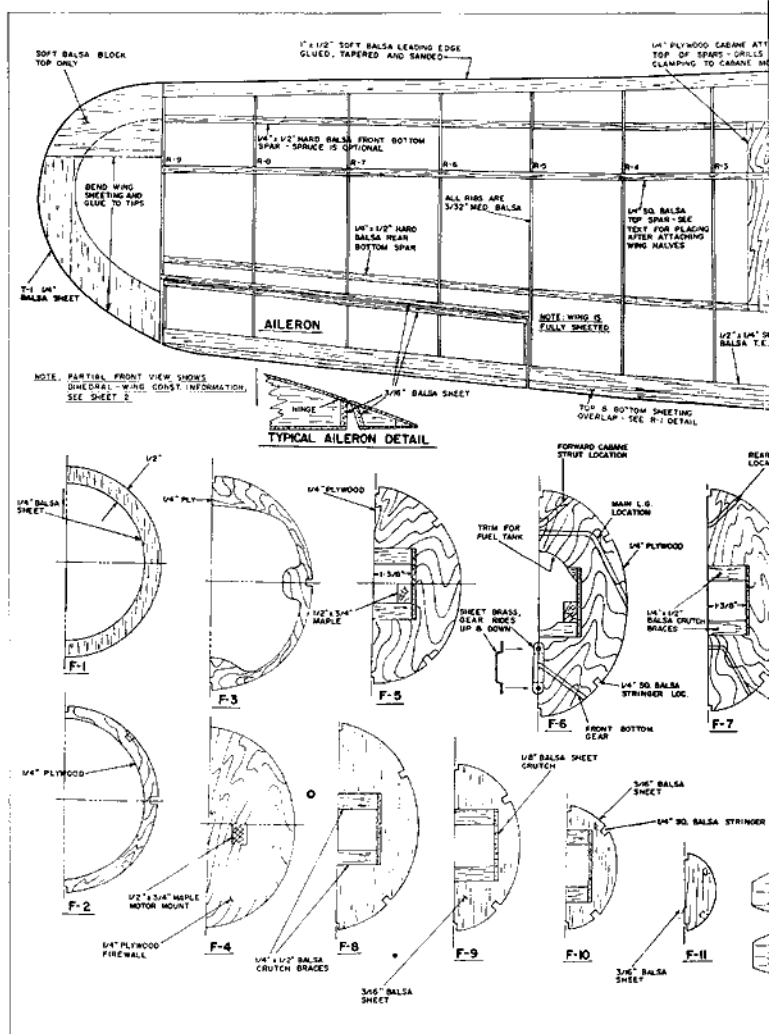
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sanded easily.) Make a sandwich of the wire and front and rear balsa pieces with two more pieces of balsa—one on each side of the strut. Use lots of glue and clamp it overnight. Carve it roughly to the shape you want, and finish it by sanding. Struts that are prone to twisting on the wire will have to be held in place by soldering small pins onto the wire.

●**Tail group.** Build the tail framework, sand it to shape and cover it with  $\frac{3}{32}$ -inch-thick light balsa. In the fuselage, cut out the slot for the stab and glue it into place. The wire that joins the elevators should be installed in its brass-

tube bearing, which is then epoxied to the stab. Slot the fuselage for the vertical fin and install the fin, bracing it with scrap taken from the bottom of the fuselage, which is still open.

Bend the combination rudder and tail-wheel wire, and secure it to the vertical fin in a brass tube. Add the rest of the fuselage planking and the tail cone, and sand everything to shape. To make fillets to go around the stab and the fin, I beveled pieces of  $\frac{3}{8}$ -inch-square soft balsa sticks and used a “sandable” wood filler. Now fit the elevators and the rudder, then add the headrest and cut

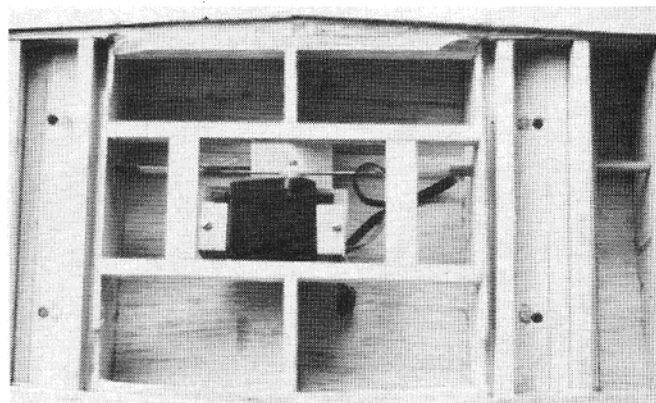


out the cockpit opening.

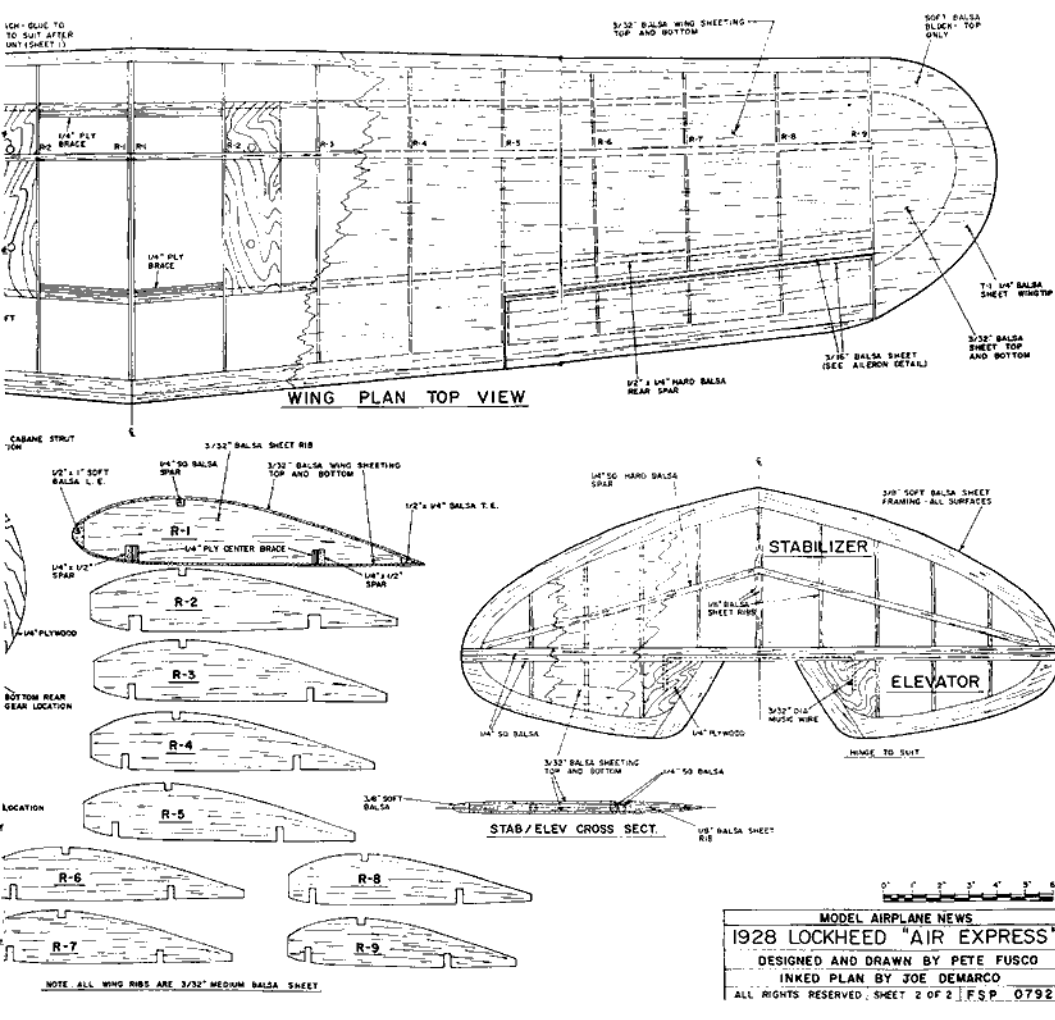
## COVERING AND FINISHING

I don't like finished coverings, but I couldn't resist the dark red Permagloss Coverite\*, which matches the original Texaco red quite closely.

I covered the bullet-shaped fuselage with five full-length pieces, and the wing, with two. This airplane has sat in the Texas summer sun for hours at a time and hasn't developed a single bubble, so the Permagloss seems to be living up to its manufacturer's ad



The top view of the wing with the aileron servo installed.



MODEL AIRPLANE NEWS  
**1928 LOCKHEED "AIR EXPRESS"**  
 DESIGNED AND DRAWN BY PETE FUSCO  
 INKED PLAN BY JOE DEMARCO  
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was operated both with and without wheel pants. Have at it.

For power, I chose a K&B\* .65 Sportster, which weighs about 10 ounces more than the typical .60-size engine. The aircraft required only about 1 ounce of nose weight. A 12x6 Master Airscrew\* prop turns about 11,400 revs and flies the 7.5-pound Lockheed quite nicely.

**TEST FLIGHT**

Test-flying was done by Ray Brickhouse at our Barnstormers Club field in New Waverly, TX. I'm a career intermediate flier and prefer to con others into doing my test-flying. Ray's legendary calmness came in very handy on the third flight, when a loose muffler clamp allowed the engine to shake out of its mounts. It stayed running, but it was held in the airplane by just the cowl. I could only imagine the pitch and yaw changes Ray was fighting. He couldn't kill the motor. When Ray yelled, "Sorry, Pete, but I think I'm going to lose it," I simply turned away and waited for the crash. Incredibly, he managed to land it safely.

With the motor firmly in place, however, the Air Express is very stable, if just a bit touchy on the pitch because of the somewhat short moments. Roll rate is fast. The ship has no bad stall characteristics—probably because of the thick, nearly scale airfoil. This also adds to its great slow-flying characteristics. Set about 3/8 inch movement on the ailerons, 5/8 inch on the elevator and all the rudder you can get.

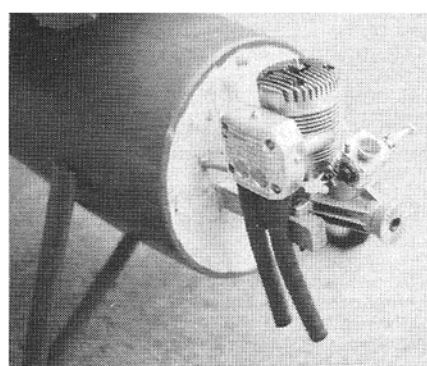
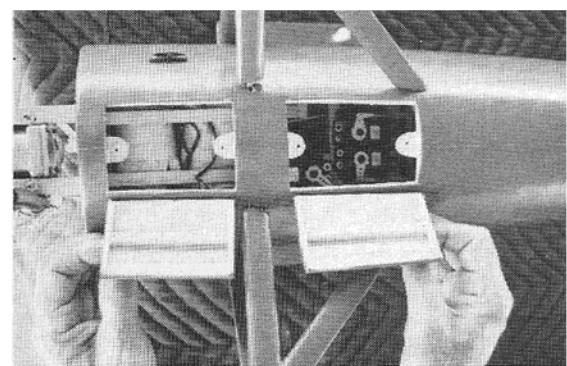
The full-size Lockheed Air Expresses are long gone, so why not build your own and put this colorful, historic aircraft back into the sky. It is, after all, a miracle only our hobby will allow.

\*Here are the addresses of the companies that are mentioned in this article: Coverite, 420 Babylon Rd., Horsham, PA 19044. Williams Bros., 181 Pawnee St., San Marcos, CA 92069. K&B Mfg. Inc., 2100 College Dr., Lake Havasu City, AZ 86403. Master Airscrew; distributed by Windsor Propeller Co., 3219 Montier Cir., Rancho Cordova, CA 95742.

claims. Absolutely nothing affects this finish. Some suggestions: use a pocket thermometer to ensure that you use exactly the temperature Coverite specifies. Also, the adhesive is a light gray, and the color accentuates seams. To mini-

mize this effect, rub the finished seams with a soft rag that has been dipped in Ironex, which you'll also need to keep the iron clean. I followed the directions (unheard of, for me!), and used Coverite's Balsarite on the bare wood. I think it helped.

I use Williams Bros. scale-type wheels, but I found that they aren't practical for everyday flying. They look good, but are simply too soft for my taste. You might consider a pair of more conventional rubber wheels. During its career, the original aircraft



■ Left: author Pete Fusco loves making hatches. The two on the bottom allow complete access to the radio and the fuel tank. They're held in place with wood screws in plywood tabs, as shown. ■ Right: the engine installation will require the type of muffler shown. The plans show beam mounts, but a radial mount would be simpler to use.