



In full military colors, L.U.S.A.C.-11 stands ready for aerial action. An exceptional rendition of this unusual airplane.

LEPERE L.U.S.A.C.-11

Built specifically for scale contest work, this two-seat airplane is of striking appearance, strong and maneuverable. /by Floyd E. Carter

Unlike many WWI aircraft, the Lepere L.U.S.A.C. -11 is ideally proportioned for RC model use. The long nose moment, and large tail surfaces, help contribute to a stable and easily flyable model. An abundance of scale detail items make it particularly attractive for AMA or FAI Scale competition. At a scale of 2"-1", the 1580 sq. inch wing and 10 lb. flying weight produce a wing loading of a scant 14½ oz./sq. foot. Plenty of control surface all around, including four ailerons, assures good maneuverability at low speeds.

Photos of the Lepere were obtained from the Smithsonian Institution, while other sources produced a detailed cockpit photo. Working drawings for the model were scaled up from available data gleaned out of several publications.

CONSTRUCTION

Most construction articles begin by telling you to start with the wings, or some other part. I will begin by telling you not to build anything!—until you have assembled all the photos, scale three-views, etc. Don't get yourself

trapped with a finished model and no documentation.

The sheet metal forming is a real challenge, so it might be fun to start there, as a test of your nerves and stamina. Once the technique has been mastered, metal forming can be a valuable part of your arsenal of construction tricks.

The best metal-forming procedure is to first make a male mold from pine or other soft wood. Next, cast a female mold, using a low-temperature alloy. Cerro Bend has a melting point of 158°F., and is quite strong when cast. If not obtainable from local sources, contact Cerro Copper & Brass Co., Alloy Department, Rolling Place, Stamford, Conn. 06907.

After melting the alloy in a pan placed in boiling water, pour the casting. If trapped air bubbles cause imper-

fections, just re-melt and try again. There should be a flat edge around the outside of the mold, for attaching the flat sheet of material to be drawn.

When stretched into the mold, some parts of the material become quite thin, so it is good to start with thick stock. T-O temper aluminum is ideal, but harder alloys can be annealed by placing them in a 500°F. oven for an hour, and cooling slowly. Attach the aluminum sheet to the mold with screws spaced about one inch apart.

Now the creative part begins. Use a vibrator type sander, to which is attached a hardwood mandrel that has been carved to a blunt-nose shape. This makes a nice hammer that strikes the aluminum sheet 60 times each second. Work the sheet slowly into the form with a circular motion, until it contacts

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LEPERE COLOR SWATCHES—AEROGLOSS PAINTS



OLIVE
DRAB



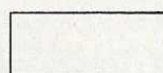
CAMOUFLAGE
TAN



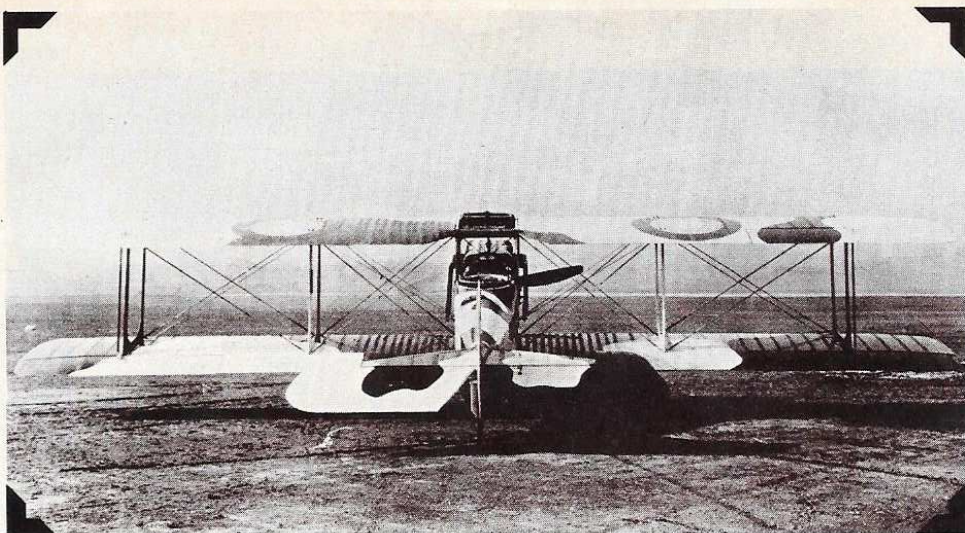
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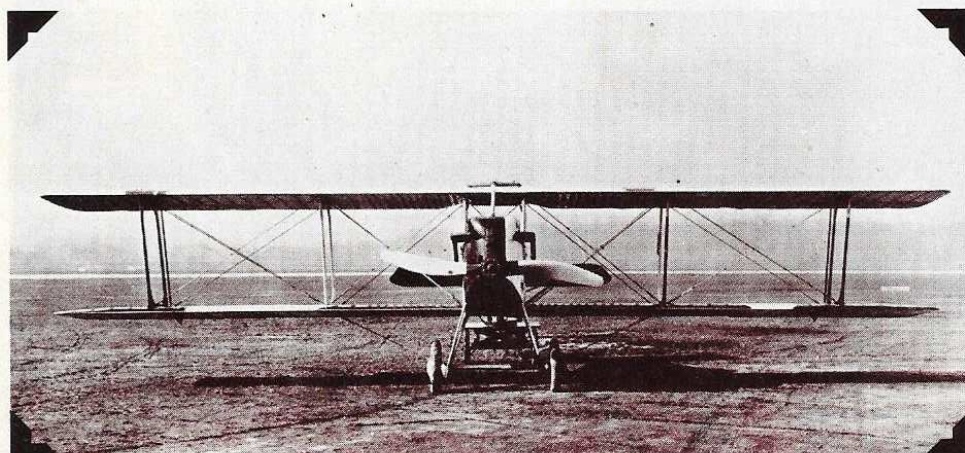
CURTISS
BLUE



SWIFT
WHITE



Piebald camouflage pattern shows up well on this McCook Field Lepere.



With a 425 hp Liberty 12A engine, this Lepere was photographed at McCook Field, in late 1918. Rushed to production, the Liberty engine would be little endeared for many years.

(Continued from page 18)

actly GHQ's fair-haired boy. But, in September 1918, he'd amassed the largest air armada ever, and helped the U.S. First Army wipe out the St. Mihiel salient. And, the following month, his command over huge air formations, engaged in mass bombing enemy targets, helped break the back of the dreadful Meuse-Argonne campaign.

But, between the political situation within the A.E.F. General Staff and the stand-offishness of the Allies, Mitchell hardly had a chance to prove out his theories. So "Billy" was in a real lather to get the Lepere accepted and up to

The Front. Oh, it was still The Front, all right, even though it was quiet now.

Ever since his arrival in France, Lt. Cottrell's duties had been split between days at the Front and days back at Colombey-les-Belles, where he tested rebuilt or newly assembled aircraft for the First Air Depot.

A smile crossed his young face. He'd gotten the job, the CO barked, "...not because you're a sensational pilot, Cottrell! Just—sensitive." True, experience and seat-of-the-pants flying do make one—sensitive.

The last 50 days of the war had been intense. (Was it really over?) The General's call, last week, meant a weekend

in Paris for six of them. And they all could use the leave. But Cottrell would have been just as happy had the CO put somebody else in charge of the expedition.

"Bill, are you awake? What time is it? Where are those guys?"

Lt. William J. Daniell yawned in the shadows: "Quit worrying, Cliff. They'll get here. After all, liberating Paris in one weekend isn't easy, you know."

Wishing he had Daniell's confidence, Cottrell stood and listened to the dark until, gradually, he became aware of the gasps of a definitely pre-war engine in the vicinity. A veteran French taxi sputtered and coughed to a halt beside the waiting airman. Happily, all of Cottrell's anguish vanished at the sight of the four tardy pilots. No military police in escort. No hysterical young ladies. And, best of all, no irate Frenchmen *avec* shotgun.

"Mother was worried," Daniell teased.

All of them barely into their twenties, all of them three weeks out of the killing—six pilots—hurried towards a waiting hangar and an unknown airplane.

When the Liberty fired up on all 12, its roar certainly got your attention.

In the previous hour, a technician had walked the pilots through the procedures of the test. And, while they checked over the airplane, he patiently responded to their questions, and recorded their comments.

Though the pilots of the 24th were a little disquieted to see single-strand elevator control wires, everyone allowed as how that could be changed easily enough. That—and the guides. The control wires slid through metal guides, and already there was noticeable wear in the area. Horsehide would be safer.

And they weren't too happy about the placement of the radiator, nor the pipe leading to the motor. With that location, in combat, a direct hit would drench both pilot and observer in boiling water. An unpleasant prospect.

But they weren't going to get shot at today. And, all in all, the Lepere appeared to be a stout, sturdy airplane. Construction and materials—all O.K. There were no qualms about taking it up.

"You first, Cottrell."

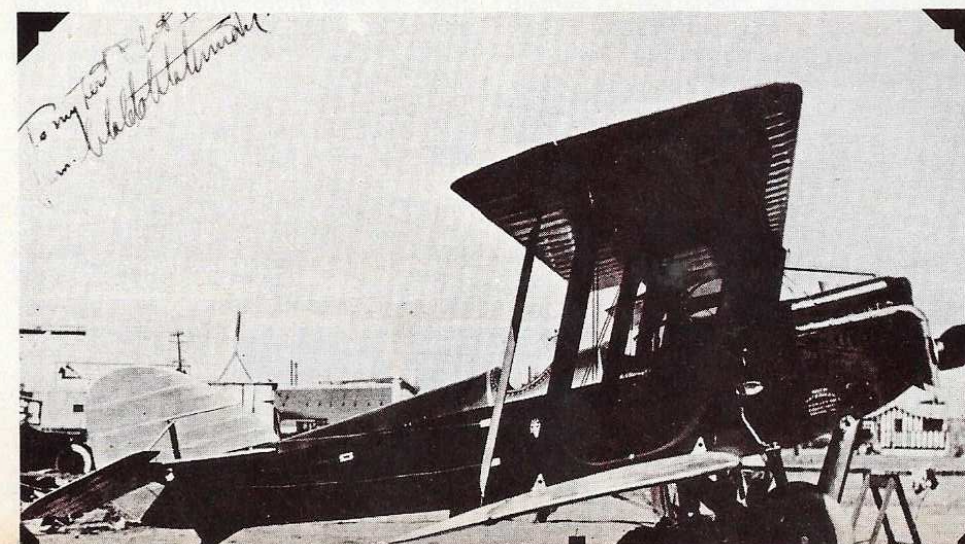
The sky was a cheerless grey and, except for the Lepere's bright red, white and blue tail, there was little color anywhere as Cottrell slipped his 5'8" frame into the cockpit. When his feet found the rudder bar sooner than expected, he cocked his head over for a look-see. *Gee, that's awfully close.*

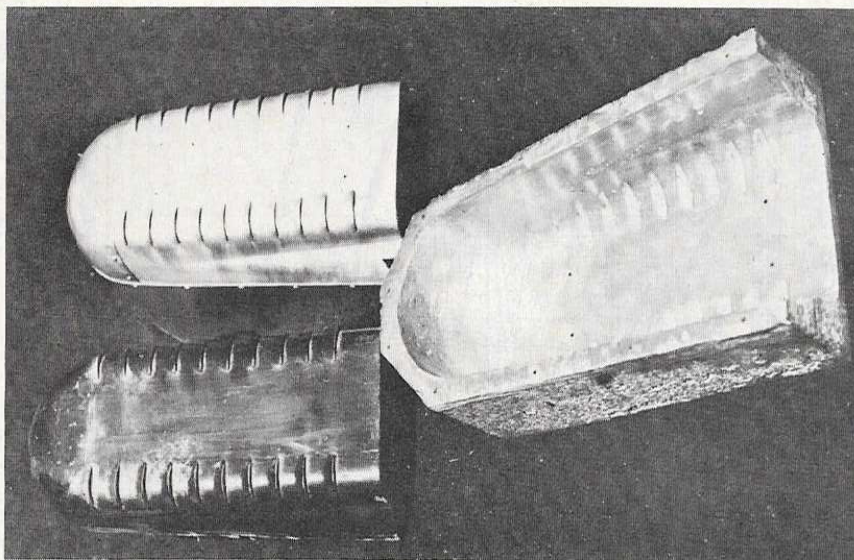
Minutes later, while 400 horses idled at a frisky rumble, he took a quick trip through the controls. *O.K. Nothing seems to bind.* And while needles bounced on the unfamiliar panel, Cottrell ran up the engine. *Notched throttle—doesn't particularly thrill me.*

Then, bumping over the rough turf towards the end of the strip, he turned the Lepere into the prevailing breeze,

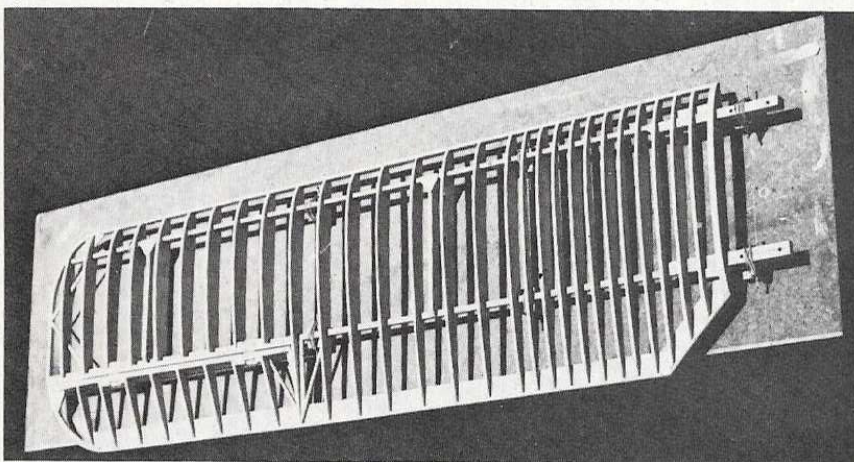
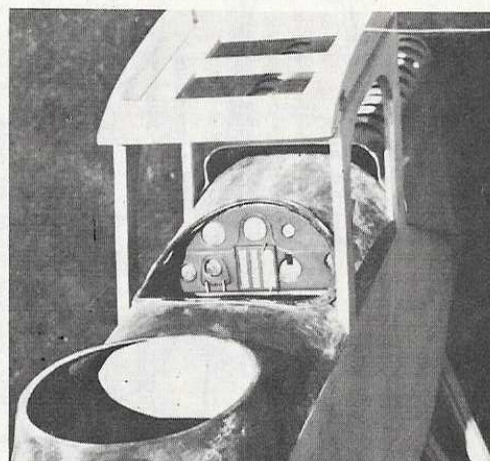
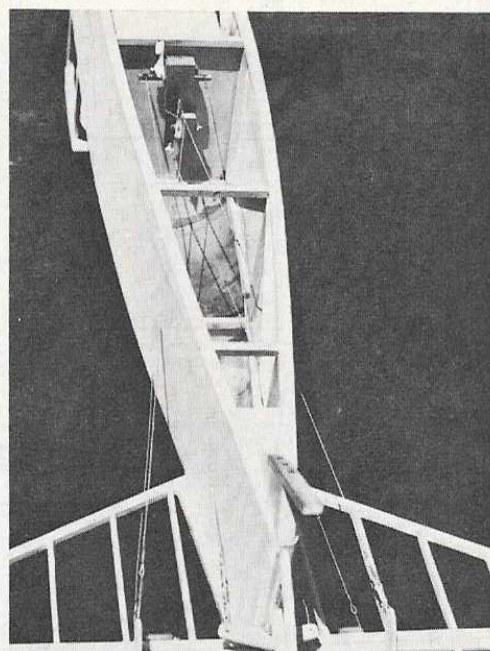
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If you can't decide whether to build a WWI or Between The Wars Lepere, how about building this civilian variant—the Waterman (L.C. Brand) Lepere.





ABOVE: To produce the authentic metal cowl, Cerro Bend is used for a hard, low temperature mold. **RIGHT:** External elevator and rudder control systems achieve scale appearance.



ABOVE: The completed left upper wing structure on its building jig. **RIGHT:** The fiberglass turtledeck, as installed on the top of the fuselage.

(Continued from page 19)

the mold. Use mandrels, made from dowels, to shape the smaller recesses. Remove the shaped piece, sand and polish.

The cowling is easier to form in two parts—the front “nose” piece, and the remaining top piece. After forming the exhaust stacks, rivet each one to a flat backing sheet. Make the individual exhaust headers from tubing and epoxy to holes drilled in the backing plate. The side louvers are all interchangeable, except for the tapered front louvers.

With the metal parts completed, we can get back to the more familiar balsa construction. The fuselage box is conventional, and should lift your spirits after all the metal work. When the fuselage sides and formers are in place, epoxy the cabane struts to the inside of the fuselage sides (checking for incidence). Face these, on the outside, with balsa to bring the struts flush with the outside of the fuselage.

The fiberglass turtledeck is made in the usual manner with a pine plug and a plaster of paris female mold. After a gel coat, lay up three layers of medium weight fiberglass at the front. Around

the gunner's cockpit, and aft, use two layers to avoid excess weight at the tail.

Begin landing gear construction by fastening the wire to plywood formers. Epoxy the inner plywood face to the wire. Next, fill in around the wire with more plywood and, finally, add the outer face. The spreader bar is made from pine, and grooved to accept the axle housing.

The important thing about the axle/wheel assembly is that both wheels are soldered to the wire axle. This prevents the wheels from turning independently, and allows straight takeoff runs with no tendency for ground looping. This is the secret for building tail draggers that have a through axle. The axle turns in a brass tubing sleeve, which has a bungee hanger soldered at each end. The bungee system is authentic and effective.

The rudder and elevator are controlled by cables. Since the elevator halves are not joined, two cables must exit the fuselage side for each elevator horn. Attach the cables to bellcranks mounted on the rear of F4. From the cranks, conventional Nyrods connect to the servos. Servo access is through a bottom hatch.

There is a shortage of cooling air around the engine, which results from building an RC version of a water-cooled airplane. The Lepere had some small holes in the cowling front, which were enlarged slightly on the model. A cylinder head heat-sink was used, which allows the engine heat to be conducted away to a larger surface area and, thus, dissipated more efficiently. Even so, engine overheating can be a problem with this model.

One discouraging feature of biplane construction is the tedious job of making ribs. The sandwich method is the quickest, and most accurate method. Make two identical metal rib patterns, and sandwich eight to 12 pieces of wood between them. Clamp this sandwich in a vise, and sand the pieces down until metal is reached on both sides. While the sandwich is still clamped together, make the rectangular spar holes with a long, slender file.

The plans show only one of the four wing panels, because the wing is built on a wing jig instead of over the plans. You can make a satisfactory wing jig by glu-

(Continued on page 72)

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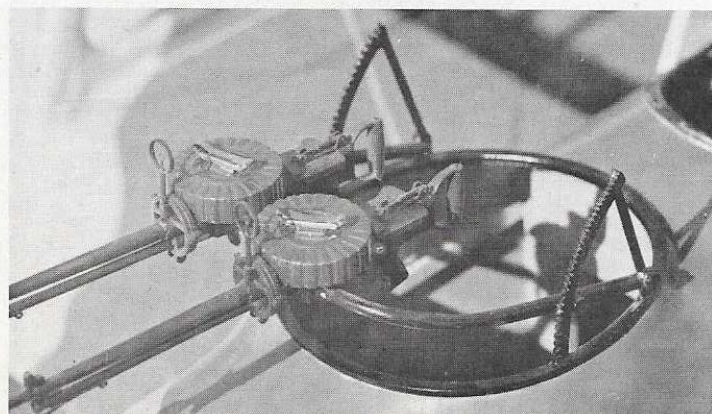
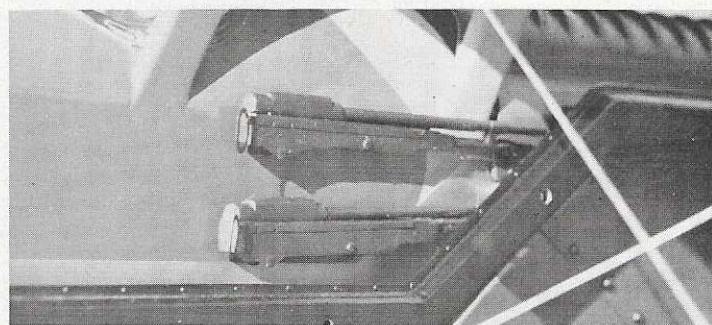
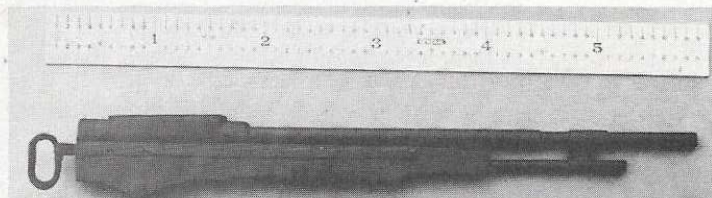
engine mounts, etc.

The complete wing is built on the work bench without having to remove it which eliminates warps — All parts are die cut, carved, etc. Balsa sheet cover keeps warps out and makes for a tough wing . . . Tapered Strip Ailerons are simple to install. Wing is installed just like the low wing jobs, using dowel pins and nylon-screw in maple nut-block, like it ought to be. No rubber bands to deteriorate or slip or tear up.

Elevator and Rudder are sheet. Stab & Fin is built up and sheet covered to keep it flat . . . so that's it, a fine kit of a fine ship.



\$49.95



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ing blocks to a building board, so that the spars rest on the blocks. Now slip the ribs onto the spars and temporarily fasten the spars to the jig blocks. Glue up everything at one time, aligning the ribs with a T-square to keep everything straight. All four wing panels are the same length and shape, except for the angled trailing edge on the top wing. This is cut after the basic structure is assembled.

Laminate the tip bow over a plywood form, which is cut to match the inside curve of the wing tip. Use four pieces of balsa, which have been soaked in hot water. Both the front and rear spars on all wing panels extend into the fuselage, where they are bolted to plywood plates fitted with blind nuts. Cut out the ailerons, add the 3/16" balsa caps and hinge them to the wing panel.

The curved parts of the tail group are made like the wing tips. When laminated and assembled, sand the horizontal tail feathers to a lifting airfoil shape. Because the tail group cross section is so thin, spruce is cautiously used in some of the construction.

The nice thing about the Lepere rigging, which is also unique, is the one-piece wing struts. These insure proper incidence between the wings. Make these from plywood, faced on all sides with balsa. Epoxy the struts to the spruce compression members between the spars.

It is the scale details and "add-ons" which make the Lepere so interesting. Make the top radiator from aluminum tubing. It is removable, to gain access to the top wing bolts. Make the windshield frame from .020 aluminum, and rivet .010 acetate on the inside of this, using Sig scale rivets. The corner posts, at the frame bends, extend into the fuselage for greater strength.

The Lewis machine guns are assembled from the popular Williams Bros. plastic kits. There are no such kits for the

ABOVE: The Marlin .30 cal. machine gun, to scale. **CENTER:** This awkward placement of the Marlin guns might have made pilots wonder just whose side the installer was on. **LEFT:** A pair of Lewis guns for the observer.

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Marlin guns. Make these from brass tubing, brass sheet and balsa, using the photos as a guide.

Because of the large wing and thin airfoil, the flying wires provide necessary bracing. To simulate the flat wires, use strips of .020 aluminum sheet, sheared to 5/32" width. Proctor streamline wires are slightly small, but could be substituted.

Covering was done with the old-stand-by, silk and Aero Gloss. The fuselage should be completely covered, except for the metal and fiberglass parts. The undercambered wings require adhesion of the silk to each rib. Do this by poking through the silk with a pin dipped in glue. The tiny holes will cover after a few coats of dope.

After brushing the first coats of clear, spray the remaining fill coats. When the silk begins to fill, dope on the simulated rib reinforcing tape, which is cut from light silkspan tissue. The photos of the original indicate that these strips are not as shiny as the rest of the covering, so don't use too much clear on them.

The roundels and stripes are masked and sprayed first. The Aero Gloss colors are Swift White, Fokker Red and Curtiss Blue. Mix the Light Earth color from white, Cub Yellow and Camouflage Tan. The photos show a shiny finish even though, later, these same colors were matte finish on war planes.

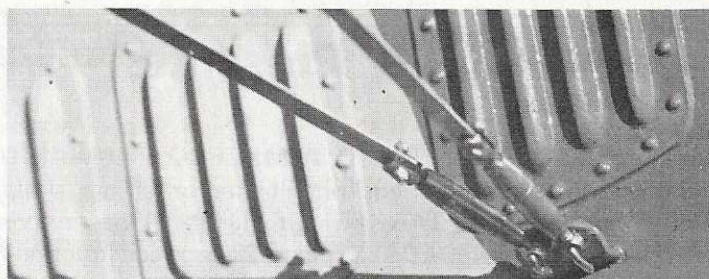
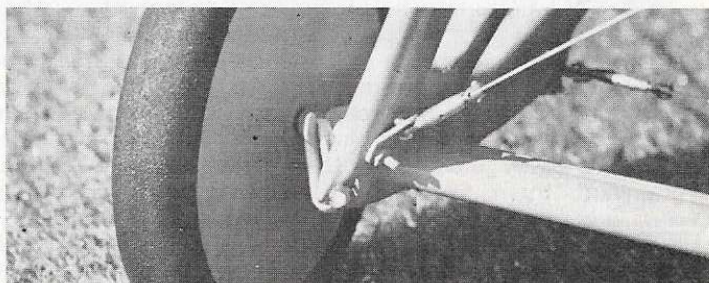
After all color painting, wet sand the model with 600A, and spray two coats of Aero Gloss Clear. The rub-on lettering is Para-Tipe 33064, 11321 and 11072. Spray a light coat of clear over the lettering for protection.

The instrument faces were cut from an actual Lepere cockpit photo, which was enlarged to scale. Some of the dials are vertical reading—quite an innovation for 1918. Frame the vertical dials with 1/32" plywood and set the round instruments in brass tubing.

FLYING

The first flight of the Lepere indicated some tail-heaviness. The CG was located per the prototype airplane, but this

(Continued on the following page)



ABOVE: Real bungee cords spring the landing gear. Wire wheels are covered with sticky Cover-rite. CENTER: Detail of the metal louvers and flying wire attachments. RIGHT: With so few breathing ducts, the engine needs a heat sink.



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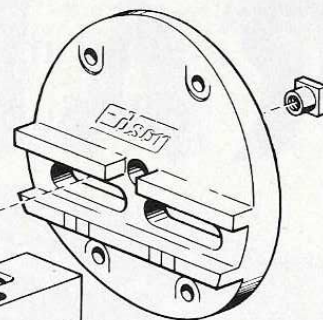
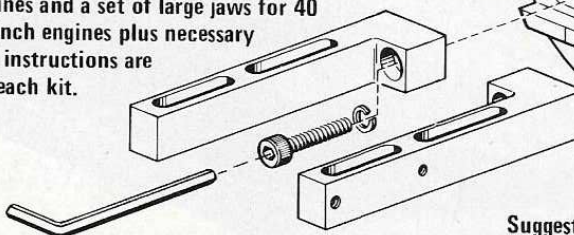
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was apparently in error. After correcting the balance, no other changes were necessary.

It is interesting to note that the ST 71, swinging a 14 x 4 prop, is more than enough to fly the model, so most of the popular 60-size engines should be adequate. The Lepere has shown no unusual handling problems. Because of its size, the model should be flown with a smooth touch. The massive wing has a tremendous lifting capacity, so try to avoid sharp pullouts from dives and spins.

The Lepere has proven to be an excellent performing scale machine. Its large size and low wing loading contribute to slow, graceful maneuvers, which are easily placed exactly where you want them.

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