

## PROTOTYPES

# "FLYING FURNITURE"

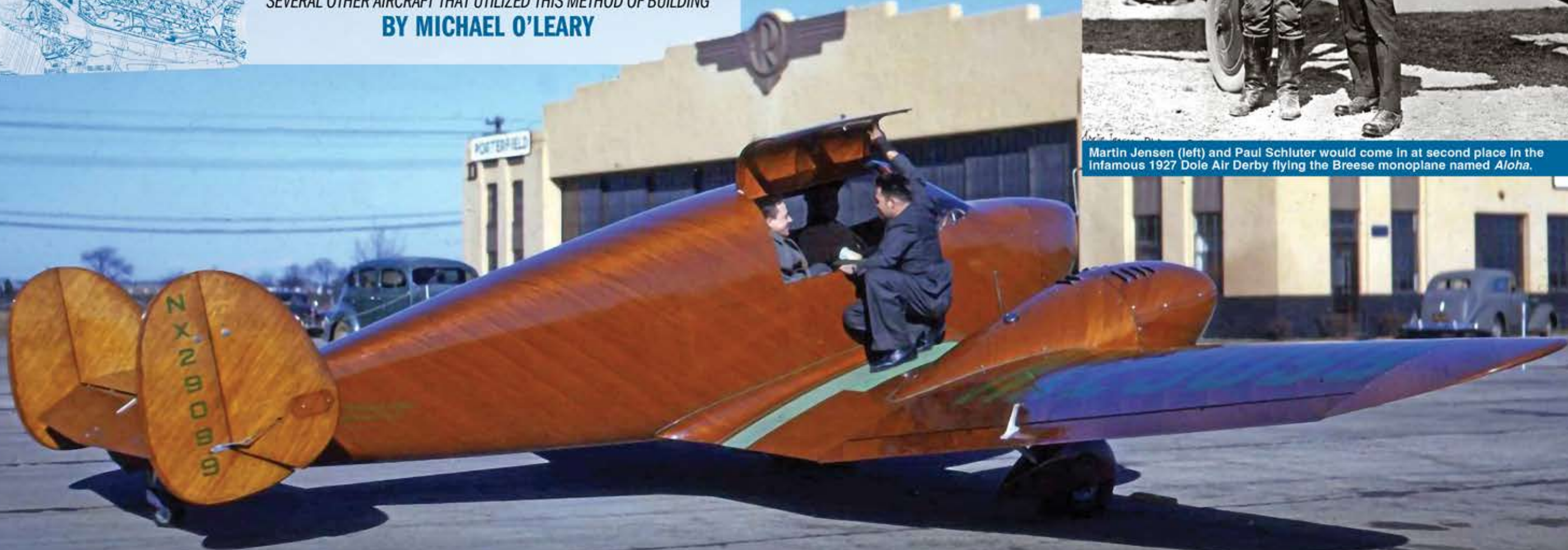
EVEN AS THE AERONAUTICAL WORLD WAS CHANGING TO ALL-METAL STRESSED-SKIN AIRCRAFT CONSTRUCTION, THERE WAS A MOVEMENT IN THE UNITED STATES TO UTILIZE "PLASTIC WOOD" TO CREATE A NEW GENERATION OF FLYING MACHINES. WE EXAMINE THE LANGLEY TWIN AND SEVERAL OTHER AIRCRAFT THAT UTILIZED THIS METHOD OF BUILDING

BY MICHAEL O'LEARY

The prototype Langley 2-4-65 photographed by Rudy Arnold in 1941 shortly after completion. As can be seen, the aircraft carries the experimental registration NX29099. The wooden skin was repeatedly sanded and varnished for an exceptionally smooth finish, which aided performance. One aviation magazine of the time period referred to the all-wood design as a "fine piece of flying furniture."



Martin Jensen (left) and Paul Schluter would come in at second place in the infamous 1927 Dole Air Derby flying the Breese monoplane named *Aloha*.



During the mid-1930s, a construction technique began to develop among several American aircraft builders. During the 1920s, Lockheed pioneered the use of wood in constructing very high-performance aircraft such as the Vega, Orion, and Sirius. Of course, wood had been a principal ingredient in aircraft construction beginning with the Wright Brothers but by the early 1930s, companies such as Lockheed were abandoning the tried-and-true method of wood construction in favor

of creating even higher-performing aircraft out of aluminum. It was obvious that aluminum was the way of the future as these structures were more capable of withstanding the stress of prolonged high-speed flight and operation. However, wood aircraft construction certainly did have supporters and for very good reasons. There was also the fact that America had many more skilled wood workers than those trained in stressed-skin aluminum construction.

By the mid-1930s, there were

numerous variants of plastic-impregnated wood products. Most of these utilized phenol formaldehyde (PF) resins but the techniques on how the products were created varied widely. Fairchild had the Duramold process and this had been developed by Col. Virginius E. Clark (who had created the Clark Y airfoil) and it was used on the company's Model 46, AT-21 Gunner, and other aircraft. Eugene Vidal (whose son was the controversial novelist Gore Vidal) created the Vidal-Weldwood

Process and this was used for the developmental XBT-11 basic trainer along with the Summit HM-5 two-seat light aircraft registered NX25332 (and the first plane to be constructed entirely from the Vidal-Weldwood Process). It was similar to Fairchild's Duramold in that both used heat-activated synthetic PF resins to bond birch veneers while pressure molds shaped the plywood. The Weldwood Process molded fuselage stiffeners and skin in one step. In Canada, the Avro Anson Mk. V used the Vidal-

Weldwood Process. At Metropolitan Airport in Van Nuys, California, Otto Timm devised Aeromold to build his PT-160/N2T-1 primary trainers. Timm stamped out parts-shaped blanks of flat spruce veneers (using dies and heated presses). At the Timm factory, the pieces were then assembled, impregnated with cold-setting PF resin, and vacuum-bag pressure-formed. The Timm Aeromold process was interesting since it required lower temperatures than other similar construction processes. The vacuum

molding process was completed at 100-degF. Once the parts were set, they were removed from the autoclave, assembled into components and then further baked at 180-degF to fully harden. Supposedly, the Aeromold Process resulted in the smoothest skin among molded-plywood components. (As an aside, when I was a high school senior in southern California I had gotten my driver's license and would often go to Van Nuys Airport. A lot of the area was still agricultural and a few miles from the airfield I saw