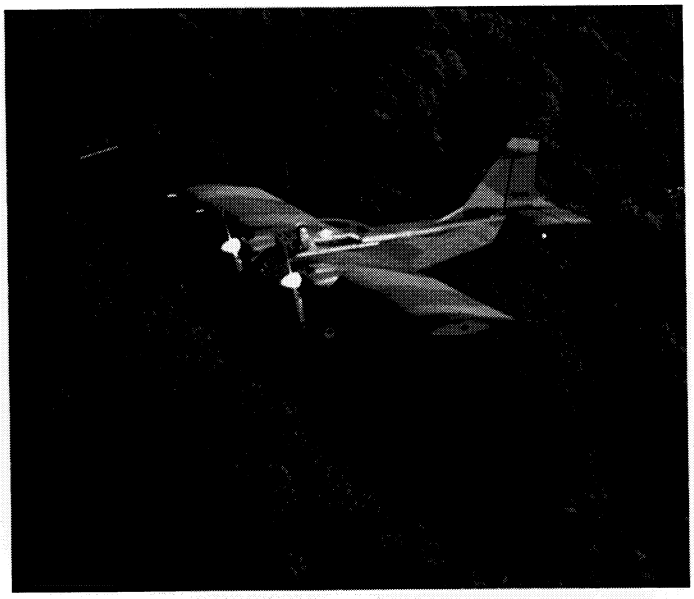
STOL Aircraft



In utility operations that involve flight over difficult terrain, such as forest or jungle, a twin-engine airplane capable of flying on one engine is much preferred for safety reasons. But a twin not only costs more to buy, it is generally more expensive to operate and maintain.

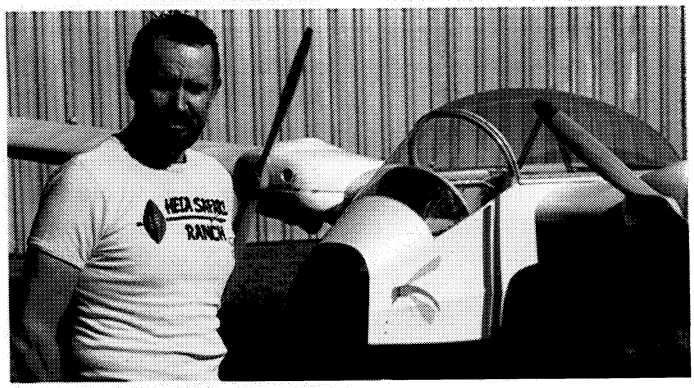
Michael E. Fisher, president of Aero Visions International (AVI), South Webster, Ohio has introduced a compromise—the Culex light twin-engine aircraft which, he says, offers the economy of operation of a single-engine plane, the ability to fly well on one engine, plus the capability of flying from short, unimproved fields in takeoff and landing distances of less than 350 feet. At right above, one of two Culex prototypes is flying a simulated transmission line inspection. At right is a ground view of Fisher and the Culex.

Culex was originally intended to be a factory built aircraft for special utility markets where aircraft are required to fly low over "hostile" terrain—terrain where loss of power would be dangerous—for example, pipeline patrol, bush operations or aerial surveillance. However, it is now offered as a build-it-yourself kit plane. AVI will provide a basic construction kit or a more detailed kit package with many prefabricated subassemblies to maximize the factory-built components.

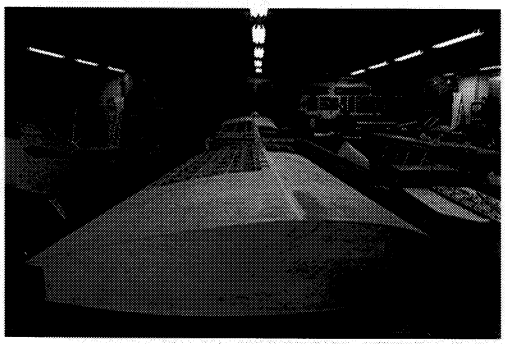
Culex was designed by AVI president Fisher with Wayne Ison and Walter J. Collie of Manchester, Tennessee. A key element of the design is an airfoil developed by Langley Research Center, which has long been engaged in designing a series of high efficiency wings for civil aircraft. Chief Engineer Collie states that the designers selected an airfoil known technically as NASA LS(1)-0417 Mod, one of a family of GAW (General Aviation Wing) airfoils for light aircraft featuring high lift characteristics and improved safety. The designers also used information from two technical reports: *NASA Low and Medium Speed Airfoil Development* and a second describing wind tunnel test results of the airfoil chosen.

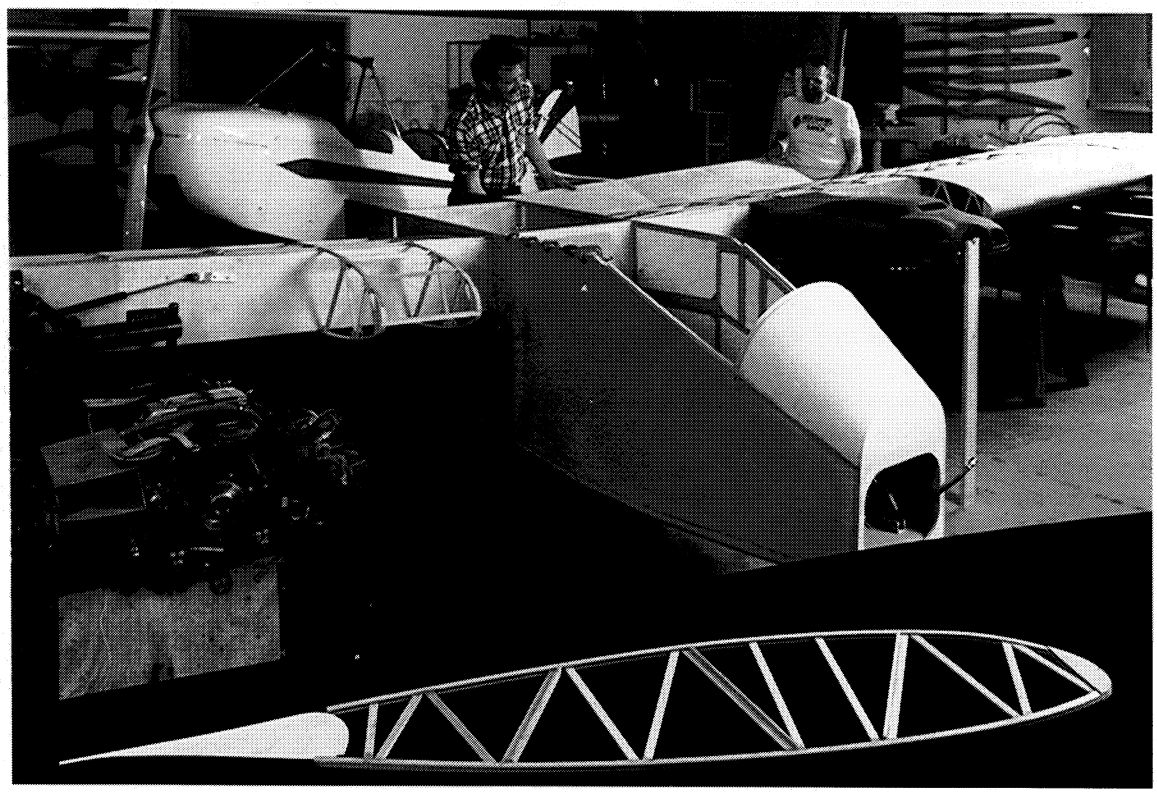
Shown in side view at right center, the Culex wing is a thick airfoil selected, says Fisher, primarily for "the safety that comes with low speed stability." It offers high lift at low speed and relatively low drag at cruising speed. Its thickness permits use of a big wing spar for greater structural strength and provides greater internal volume for fuel shortage.

The wing "skin" is aircraft plywood, as is the whole airframe. "Wood is nature's composite," says Fisher. "We prefer wood for airframe structures because it absorbs the bending moments associated with flight loads without developing fatigue and it doesn't corrode." At upper right is a nearly completed airframe awaiting installation of its plywood upper skin.



Culex cruises at 140 miles per hour but the high lift wing gives the aircraft a stalling speed below 50 miles





per hour. The company has flight tested two prototypes, one a 1,200 pound version with two 80 horsepower engines, the other a 650 pound version with two 48 horsepower engines. During the test program, Culex demonstrated its ability to climb at 350 feet per minute with one engine shut down.

At left, AVI employees are installing flaps on a third prototype, which has one engine in place and the other awaiting installation.

Below, a worker is producing wing ribs with the aid of a construction jig; the wooden parts are bonded together by polyester resins for superior strength characteristics. ▲