

KIT AIRCRAFT GUIDE

ARON KILBY



THE WEEDHOPPER

Build it fast. Fly it slow.

In the beginning there were hang gliders. Then some enterprising souls, not content with mere gliding, attached chain-saw or snowmobile engines to their hang gliders, and the first ultralights were born. It was not long before ultralight-kit manufacturers began to spring up all over the country, offering an ever-increasing degree of sophistication to this newest of aircraft categories.

"What is an ultralight?" you ask. The primary defining feature of an ultralight is the ability to launch and to land the craft by foot. It follows, then, that it must be very light, if the pilot is to support the craft's weight adequately during the takeoff "run." Most ultralights weigh in at about 160 pounds, empty. While a foot launch in one of these babies is possible, it is more for the purpose of meeting the regulatory strictures than for use as an everyday procedure. Feature yourself chugging along, toting a 160-pound load with a 30-foot wingspan, waiting for your liftoff speed, and you will opt for a wheel launch every time. In fact, manufacturers recommend the wheel launch as a normal procedure.

Today there are a host of ultralight kits to choose from—single- or twin-engine, pusher or puller, two- or three-axis controls and even some float-equipped models.

Perhaps the busiest designer of ultralight

WEEDHOPPER	
Kit price	\$2,995 (complete)
Construction	Metal and fabric
Time to build (est)	40 hr
Specifications	
Engine	456 cc Chotia 460, 2-cycle, 32 hp @ 3,700 rpm
Wingspan	28 ft
Length	18 ft 6 in
Wing area	168 sq ft
Seats	1
Empty weight	164 lb
Useful load	216 lb
Fuel capacity, std/opt	1 gal/3.5 gal
Performance	
Takeoff roll	100 feet or less
Rate of climb (w/150-lb pilot and 1 gal fuel @ sea level)	600 fpm
Never-exceed speed	43 kt
Cruise speed	26 kt
Range	
1 gal fuel/3.5 gal fuel	22 nm/78 nm
Sink rate	
Single-surface wing	350 fpm
Opt double-surface wing	300 fpm
Glide ratio	
Single-surface wing	7.3:1
Double-surface wing	8:1
Ceiling	10,000 ft
Maximum stress limits	+5 Gs, -2 Gs
Stall speed (w/150-lb pilot and 1 gal fuel)	16 kt
<i>Based on designer's figures.</i>	

kits has been John Chotia, an ex-National Aeronautics and Space Administration experimental machinist who formed Weedhopper of Utah back in 1978. The Weedhopper line presently offers kit-builders a choice between two basic designs—the two-axis Weedhopper and the newer, three-axis Gypsy, a taildragger design with a "fuselage" that surrounds the pilot. With more than 1,000 Weedhoppers sold to date, they are the mainstay of the company.

The Weedhopper is simpler to build than the Gypsy and less expensive to buy. The price of the standard Weedhopper is \$2,995; this includes the Chotia 460 two-cycle engine—an engine designed and built by Chotia himself. Completion time for the Weedhopper will run about 40 hours. The tools required are simple, just a drill, a hacksaw, a hammer, a file, a pop riveter, a screwdriver and a few wrenches. For making accurate, straight holes in all that aluminum tubing, a drill guide is included in the kit, and abundant step-by-step photography helps assure that your construction proceeds with as few goofs as possible.

The structure itself is the essence of simplicity. Seamless, 6061-T6 aircraft-grade, aluminum tubing is used, with larger tubing and/or wood dowels to help reinforce the attachment points. The wings are made of

heavy, 3.8 ounce-per-square-yard dacron sailcloth. The wings on the standard model are pre-sewn to fit into place. If you are so inclined, the kit can be ordered without the sailcloth (saving you \$500), and you can build a rigid-wing version using the traditional doped-fabric method. Making your own wings this way will take you an extra 30 hours of work.

Curved aluminum battens give the standard wings their airfoil shape; other aluminum parts that require bending or machining come pre-bent and pre-machined. All you have to do is a little bit of filing and drilling, plus some sawing and pop riveting. The sawing is required to cut some pieces to length, and the riveting attaches the wing's ribs to their tips.

The control system for the Weedhopper also is designed with simplicity in mind, and it makes you wonder. The control stick is off to the right of the "cockpit," about where your right hand naturally would fall. A direct pushrod linkage connects the stick to the elevator for pitch control, and cable-pulley arrangement—also tied in to the control stick—goes to the rudder. Sorry, no ailerons on the standard Weedhopper, so turning is a matter of inducing a yaw with the rudder. The wing on the outside of the turn speeds up, which results in an increase in lift, a rising motion and then the turn.

Though stalling out of an uncoordinated turn is a good way to initiate a spin in a conventional airplane, Weedhopper's promotional literature states that "there seems to be little tendency to spin inadvertently out of a banked turn or level flight stalls." The \$75 for an optional aileron kit seems like a worthwhile investment.

One big advantage of the Weedhopper is its portability. The wings and the tail section can be detached from the body of the craft for transportation on the roof rack of a

car or van. Once you have arrived at the launch site, it only should take you 30 minutes or so to set up the Weedhopper. Setups require no tools at all.

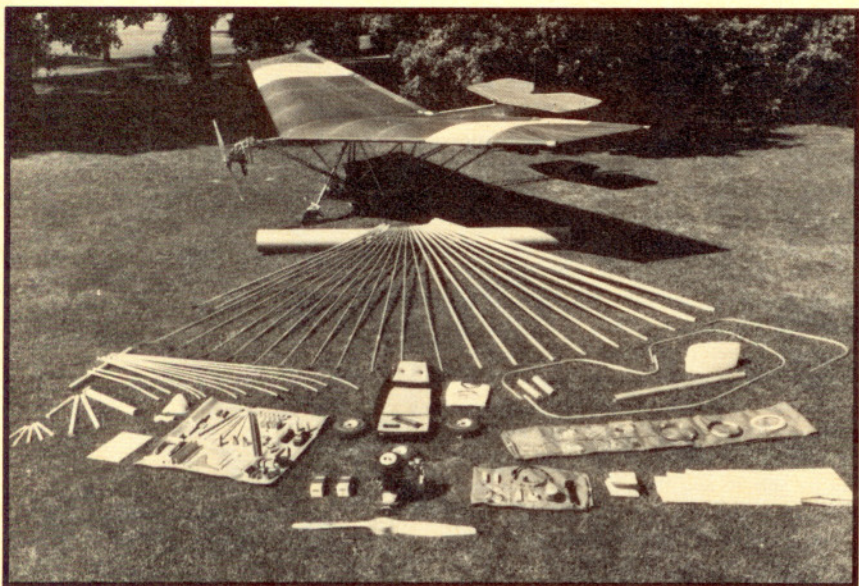
Lord help you, if any of those bolts have worn their heads off or have enlarged the holes in the aluminum tubing. Chafed, kinked or worn-out wire braces also are not conducive to pilot longevity. As with any aircraft, a thorough preflight is in order, each time you fly.

Perched up front, out on the end of the aluminum tube that serves as the fuselage boom, is the Chotia engine. It is unique for several reasons. First of all, it is an engine designed solely for use on an ultralight. Other ultralight manufacturers are dependent on Chrysler or McCulloch engines for their power, and recent concern about product liability has caused these companies to take measures to ensure that their engines will not be installed on ultralights.

What started out as a 25-hp engine now has evolved into a more powerful, 32-hp fuel injected design that incorporates more efficient intake ports and a dual spark-plug arrangement. Electricity for the sparks comes from four D-size flashlight batteries and a dual-coil system. You can get about 20 hours of flying from one set of batteries.

Looking to the future, Chotia plans to offer a \$700 belt-reduction drive option that would drive a (gasp!) six-foot-diameter propeller, further boosting horsepower and performance. A recoil starter also is in the works. The engine carries a one-year or 100-hour guarantee.

Buying and flying a Weedhopper is one way of easing yourself into the world of homebuilding. The construction process probably is the simplest available on the market today, and the sensations of low, slow flight give you something in common with America's pioneer aviators. —TAH



The Weedhopper kit. The engine shown here is the old, round-head design and has been replaced by an improved engine. A wooden dowel in the fuselage tube gives support for the engine mount.