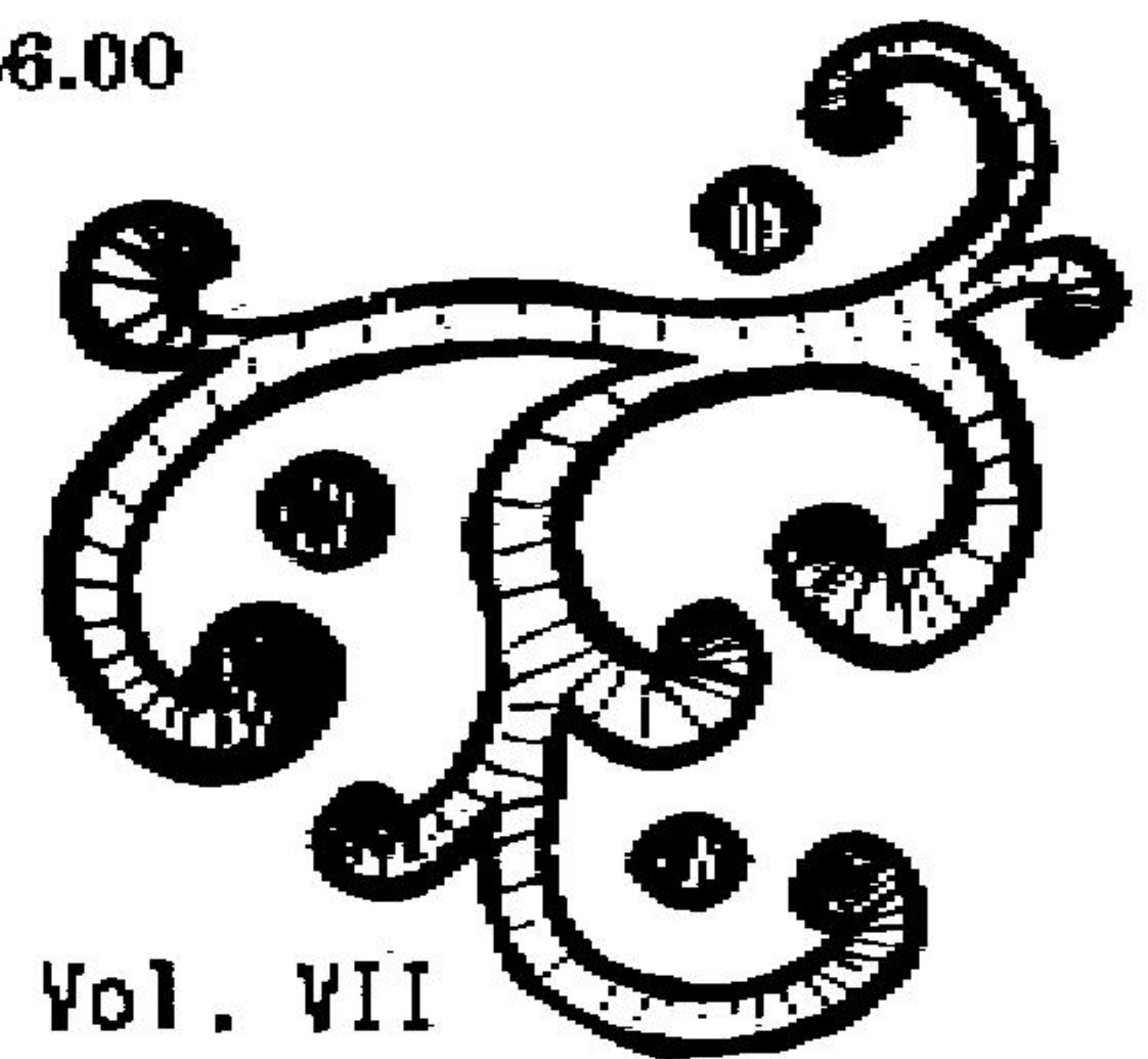
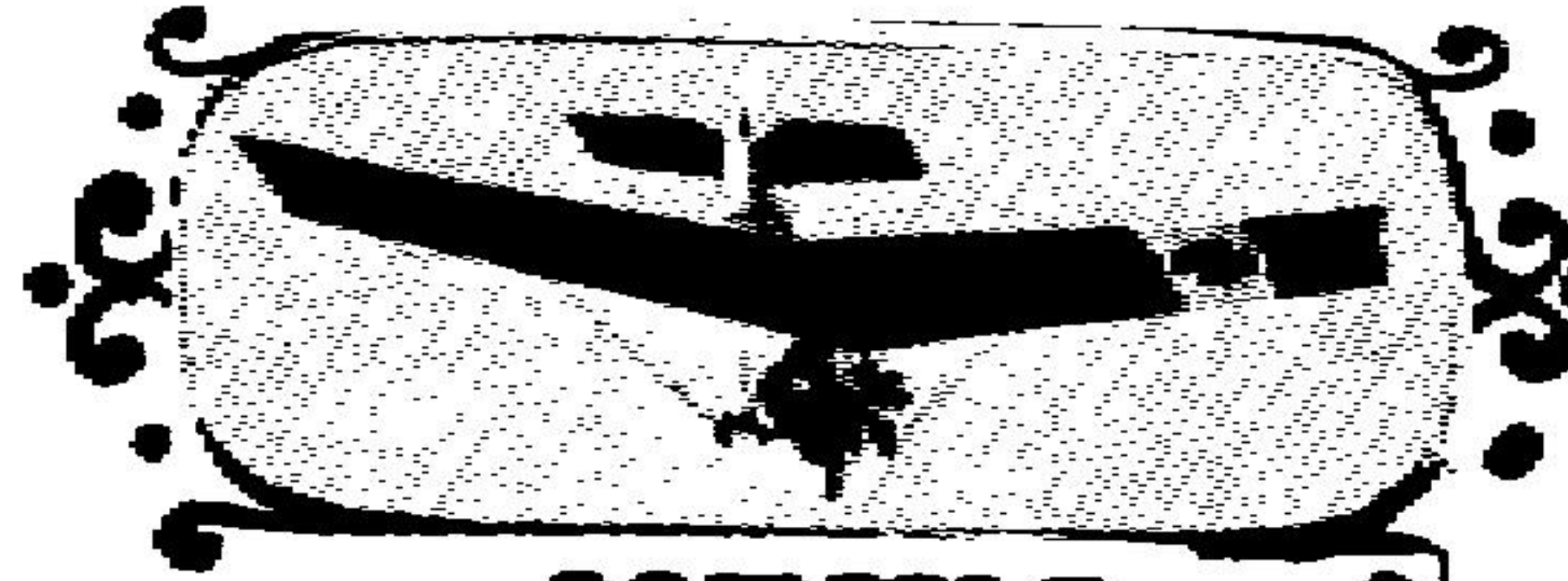




# WEEDHOPPER™



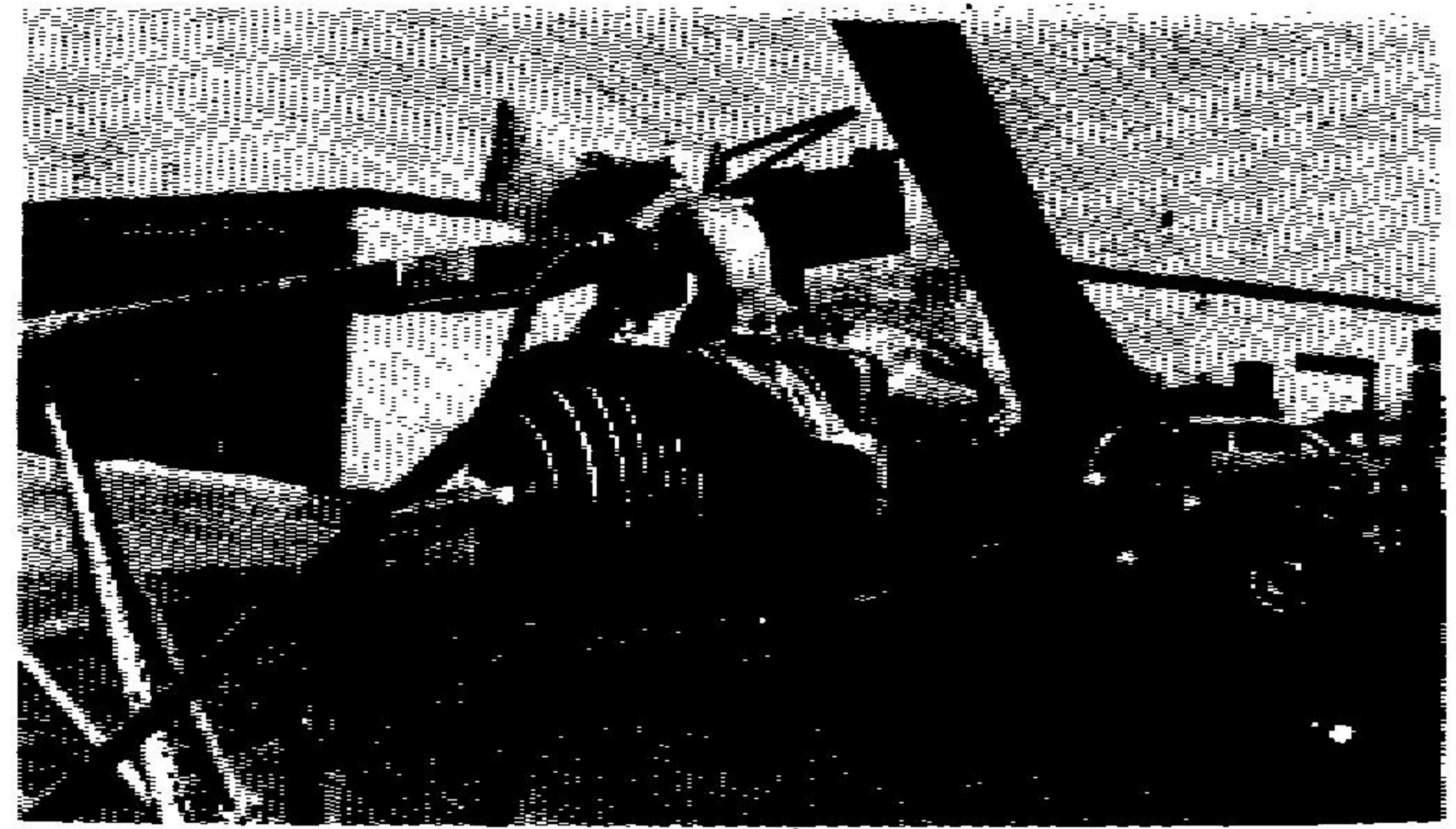
Weedhopper of Utah, Incorporated  
Box 2253, Ogden, Utah 84404 (801) 621-3941

## NEWS

June 1979, Vol. VII



EXPANDED MACHINE SHOP IS NOW ON  
50+ HOURS PER WEEK.



FIRST PRODUCTION-LINE ENGINE AS  
FLOWN.

### WHERE ARE THE ENGINES?

This is the explanation of why the engine deliveries are late.

When we started the Weedhopper program we had over 280 snowmobile engines lined up. However, the favorable publicity the Weedhopper received, plus a general interest in ultralight aircraft quickly dried up that supply and we were forced into our own engine program earlier than planned. (Those single cylinder aircooled snowmobile engines are no longer in production). As a result, we were able to obtain far less supply than anticipated. This sudden rush is really only a secondary problem; onward to the primary delay factor. As it is, we have taken the Chotia 460 engine from drawing board to production in less than a year.

The real delay began when we were unable to achieve the 50-55% prop efficiency which was projected due to our lower tip velocity. Truly, the snowmobile engines pushed .95 MACH at peak power and their efficiency was quite low, approximately 25-27%. The C-460 prop is only .67 MACH but we were only able to achieve 35-37% efficiency; as a result, the designed 18.5 HP (and real 18.3 HP) was not near enough

to get the performance we wanted. The culprit here is the low amount of air mass which passes through the prop disk. The Weedhopper's 42" prop at 27 MPH puts 3 times as much energy into each pound of air as compared to a 100 HP, 100 MPH plane with a 72" prop. The result is the air slips away and the prop wash must move at 65-70 MPH to provide enough thrust, almost like a jet blast, as opposed to a normal plane (100 MPH, 100 HP) where the prop acts like a rotary wing.

The solution was simple (? was it?) we needed more horse power. Fortunately, I had designed a large margin of reserve, with 28.3 cu. in., it was possible to get the extra (needed) power. But it took more time, and I didn't want to use a tuned pipe, or increase the prop speed to where it would be noisy again (like the snowmobile engines).

This requirement for relatively low speed and no fancy exhaust slowed things a bit. Had I known the prop efficiency would not be as the books predicted, then I would have designed a bigger displacement engine, but we have the C-460 (28.3 cu. in.) and it now works as required.

Continued . . .

## ENGINES (continued)

We hoped to use outside suppliers to do some of the machining, but our first orders came in very late and of poor quality. As a result, we purchased our own equipment and hired our own machinists. More delays, but necessary to provide the quality product we now have.

Also near the last minute I decided to add an automatic centrifugal timing advance system. I was worried that with the original manual system, someone might forget to retard the spark and the engine might kick back and hurt someone. The auto-system now works fine and is ready to install.

Propeller development also slowed things down, since with every engine tuning change, a new series of props needed to be tried. We finally made a ground adjustable hub with bolt in, replaceable blades which greatly speeded testing. We could run a series of different pitch settings, then trim the diameter and run a new series of pitch settings. We tested as many as 15 to 20 various combinations in a single day.

Perhaps I've been too demanding and narrowed my acceptable limits more than necessary, but the C-460 will now perform as I want, and that is more than just acceptable. It idles well and smooth, starts easily, runs consistently and produces ample power without a tuned pipe or high RPM's. The performance, smoothness, and reliability matches that of the Weedhopper airframe, which is excellent.

As you read this, the first group of engines has started going out. Production of engines is still slow, but improvements and expansion continue. I am sure you will be pleased with the end result. We now have 4 full-time machinists working 50 hours per week. This and tooling improvements are showing steady gains in production levels.

I fully appreciate the concern of those who have not received their engine package yet, since aviation history is full of failures (BD-5 etc.), and I also appreciate the patience and understanding many of you have exhibited. Your faith

is not misguided and we have not failed. However, if you phone and want to talk to me personally, I probably won't be available. This is because I am working on the production line, or tooling changes, etc. If you wish to come and see what is going on, we welcome visitors, but I, unfortunately, do not have the time to spend on the phone right now. Perhaps in another month when we start to catch up. . .

Sincerely,



John F. Chotia

### F.A.A. AGAIN - -

Nothing new yet, but we know a ruling proposal of some sort is in the works. The F.A.A. needs to take some definitive position with regards to Ultralight Aircraft.

After observation of how these planes are actually used, I have made the following suggestion:

**DEFINITION:** Maximum wing loading of 2.5-3 lb. per sq. ft. at maximum gross takeoff weight, would not need to be licensed. I feel a maximum weight is really unnecessary because the engineering and controlability will limit practical planes to under 450 gross. The low wing loading means low speeds, there is no way around it. The low speed limits controlable wing span, which limits area (with reasonable aspect ratio) which in turn limits gross weight indirectly. If a maximum gross weight limit must be applied, then 400 lb. seem reasonable, yet the wing load alone is adequate if a simpler definition is needed. The object here is to provide design freedom for safety, and still avoid "normal" aircraft speeds, range, and potential for damage.

**PILOT CERTIFICATION:** None required. The problem here is that a Weedhopper, or similar ultralight aircraft, is so different from normal aircraft that there is little relevance in the current training programs. We recommend dual instruction for familiarization with stalls, landing approaches, banked turns, etc.

The third class medical required for the present student license is ridiculous. Gliders do not require a physical and yet they make much more prolonged, high altitude flights than any ultralight and most all are over 400 lb. empty weight. Simple knowledge of the flight restrictions (see below) is all that is needed for safety.

AIRCRAFT CERTIFICATION: None required, (as long as the plane is single place). The reasoning is the F.A.A. could gain little for the effort and workload required to certify this new horde of microlights. Even the "foot launchable" variety, now unlicensed, have shown that aircraft certification in the "experimental" category would not improve safety. (Wheels and improved controls have shown safety improvements without affecting speed and weight parameters.)

FLIGHT RESTRICTIONS: This is sticky and I suggest these limits in the interest of a program the F.A.A. can sell to congress and the public as well as recognizing that better than over 95% of all Ultralight flying I've observed already voluntarily meets these limits.

1. Maximum altitude of 1000 ft. A.G.L. (!). Most all ultralight pilots stay under 1000 ft. unless thermaling, its a fact. I would prefer no altitude limit, yet that would allow the possibility of conflict with normal air traffic, and we know what type of public outcry that would bring. This is not in reality a great concession to trade for no license nuisance and it will give the F.A.A. a sales pitch to show that our "uncontrolled" activity would be "controlled", that is limited to airspace not in use at this time. If a person wishes to exceed this limit legally, he (or she) should have the option of obtaining a normal license to do so.

2. No flights over densely populated areas.

3. No flights within 3 miles of a controlled airport. I've observed ultralights at uncontrolled airports and there have been no conflicts, yet their slow speed would create an inconvenience at busier (tower control-

led) airports. Also their lack of radios (or a place to put them, generally) precludes control tower operation anyway. Again the individual should have the option of obtaining a license and radio if desired.

4. No flights in T.C.A.'s or restricted airspace. This is obvious, who wants to get shot down?

I feel this program would allow freedom of design to provide for development of safe, recreational flying at reasonable cost. While at the same time the F.A.A., congress, and the public are assured of adequate separation from normal air traffic to prevent an ultralight bringing down a 747. The ultralight pilot and plane can fit into the overall pattern of airspace use and still have a great deal of freedom while the F.A.A. is not over worked further. If higher, faster, farther flying is desired, then the existing "experimental" and pilot licensing would be available as are \$20,000 factory-built planes. What I suggest is giving us the airspace nobody else uses anyway and we will promise to stay out of the way. Unless they look down, they won't even know we are there!

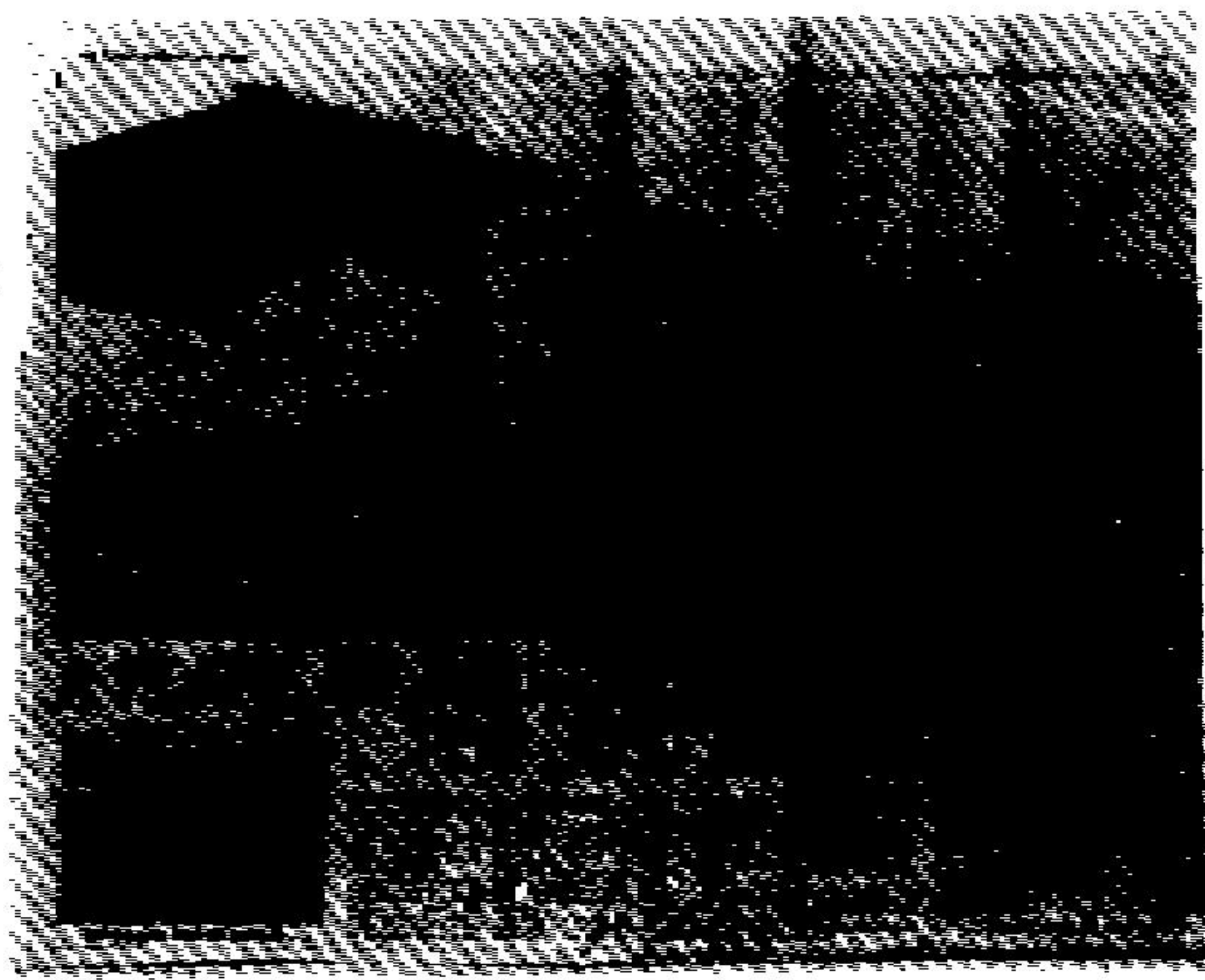
#### OSHKOSH

We will be there. John Chotia will speak at a forum on the Weedhopper "B" Model Sunday, July 29th, at 12:00-1:15 and on the Chotia 460 Engine Thursday, August 2nd.

The \$500 prize for best craftsmanship and the \$100 for second place will be awarded with or without an engine installed. We are air freighting power packages (we pay shipping charges) in order to get them out and customers in the air as soon as possible. The customers will not be penalized for our delays though.

Trophies for longest distance traveled, oldest builder, best trailer, etc., will also be awarded for Weedhoppers with or without engines.

Arrive early as possible since we want to try to organize a Weedhopper camp and get flight line space together if possible.



The Weedhopper was featured in the British national newspaper the "Sunday Express" June 10, 1979. The photos are of Steve Groat, Serial #0004, and the reporter called Weedhopper headquarters in Utah for the interview.

Weedhopper interest is world-wide.



T-shirts - \$5.00 each

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