

I've had the opportunity to do a lot of flying. I flew with Dr. Martin in Florida at the Delta hanger. Frank Kieser and his wife Betty were there, had a good time but had a hell of a time getting my Ornithopter to fly. I'm flying Frank Kieser designed model, the best time I did was 6 min 30 sec.

I think Frank's model will do 15 min. I modify it and build a 1.1 gram one that did 11 min. 54 sec. at Arkon Ohio for a new Cat. 10 record. I could have made 12 min., cause My model hit a table at about 3 feet off the floor and came to rest at 11 min. 54 sec.

Frank Kieser also set a new Cat. III record 8 min. 28 sec. April 19 at the Rolunda of Columbia Univ., but a week later I flew at the Jim Jones armory in Chicago. My best flight was 8 min. 40 sec. for a new record for Cat. III.

I had one shot at Cat. II, the best time was 7 min. 03 sec.

I haven't had a chance to get into the Union gym Cat. I flew a couple of times this year and the best time was 4 min. 40 sec., 5 min. 25 sec seem a long way off.

The model Ornithopter plan is one I got from the Japanese at West Baden World Championship and it flies pretty good.

Thank to Dick Johnson and his buddy Jack Hereford for there new ideal.

I didn't get to the USIC contest, but hope to see everybody at the Lincoln Nat. Frank Kieser and Myself are going and hope to come away with a new Cat. II record. I like Frank comment and I to thank you should win with SKILL, not a lucky bounce off the ceiling.

Roy
Roy

Dear Whites.....

February 16, 1987

Thanks for the manuals and newsletters. I spread them where I hope they will sprout.

Based on what I see showing up as far as duration is concerned, and reading of some of the serious thoughts offered by several of the OMS members, I am almost reluctant to send the enclosed sketch to you, or to even discuss the thinking behind it. But, I believe that there are some dead serious questions that I do not have answers for and I cannot think of a better bunch than the OMS crowd to try on the ideas. Here goes.....

My dear friend and super thinker, Jack Hereford, has suggested the possibility of combining ornithopter and helicopter functions. He first prototyped a motor driven device that placed helicopter type blades at the 12, 3, 6, and 9 o'clock positions around a central member. By his use of a scotch yoke mechanization, he makes these blades move up and down through some limits. Opposite pairs are driven so that when one pair is up, the other pair is down. The blades themselves are attached so that their C.G. is behind a pivotal attachment. Oscillation of the blades causes a pitch change and a lift vector is created. This vector has both a vertical and a horizontal component. The horizontal component produces a torque about a central axis of rotation and the device begins to rotate. As the rotation rate increases, the velocity causes the lift vector value to increase, as do the horizontal and vertical components. It was not intended that this machine produce enough vertical lift to sustain itself, but rather just to observe the operation. It performed as expected and air was definitely deflected downward. He elected to call this contraption a Helithopter.

We have cussed and discussed such oddball ideas over the phone for some years now, and often times, each of us will attack the schemes suggested from slightly different perspectives. Such was the case here. Since I visualized a different type of mechanization than Jack, it seemed fitting to also consider a different name for the critter. I felt that Ornicopter also described the unique device. I was also looking for a good excuse to do something with the ideas employed by Lester Garber with his Tandem Ornithopter as described in OMS Volume III number II. Four attempts were made, all employing the reaction technique used with the Garber device. Two used the slotted mechanism he suggested and two used the more conventional crank and link. The enclosed drawing represents the best of the bunch....but hardly an advertisement for the scheme. All flapped and fluttered and rotate like crazy. They just wouldn't maintain launch altitude or climb. Number 3 used the Garber mechanism and Jap tissue covering. No.4 employed the linkage shown on the sketch but was covered with Microlight....a horrid material....Although Number 4 was lighter than No.3, 7 grams vs 9.8 grams with rubber, I feel that the heavier machine tried harder. There was also an indication that No.4 did better upside down. I can say this, this

device produces the shortest duration of any ornithopter I have ever built, by a large margin.

Just a day or two ago, Jack called to tell me that he has had marginal success with a guessed at four gram version of his design that will climb, but it will not do it for very long. In time I will get a sketch from him and will pass the latest on to you.

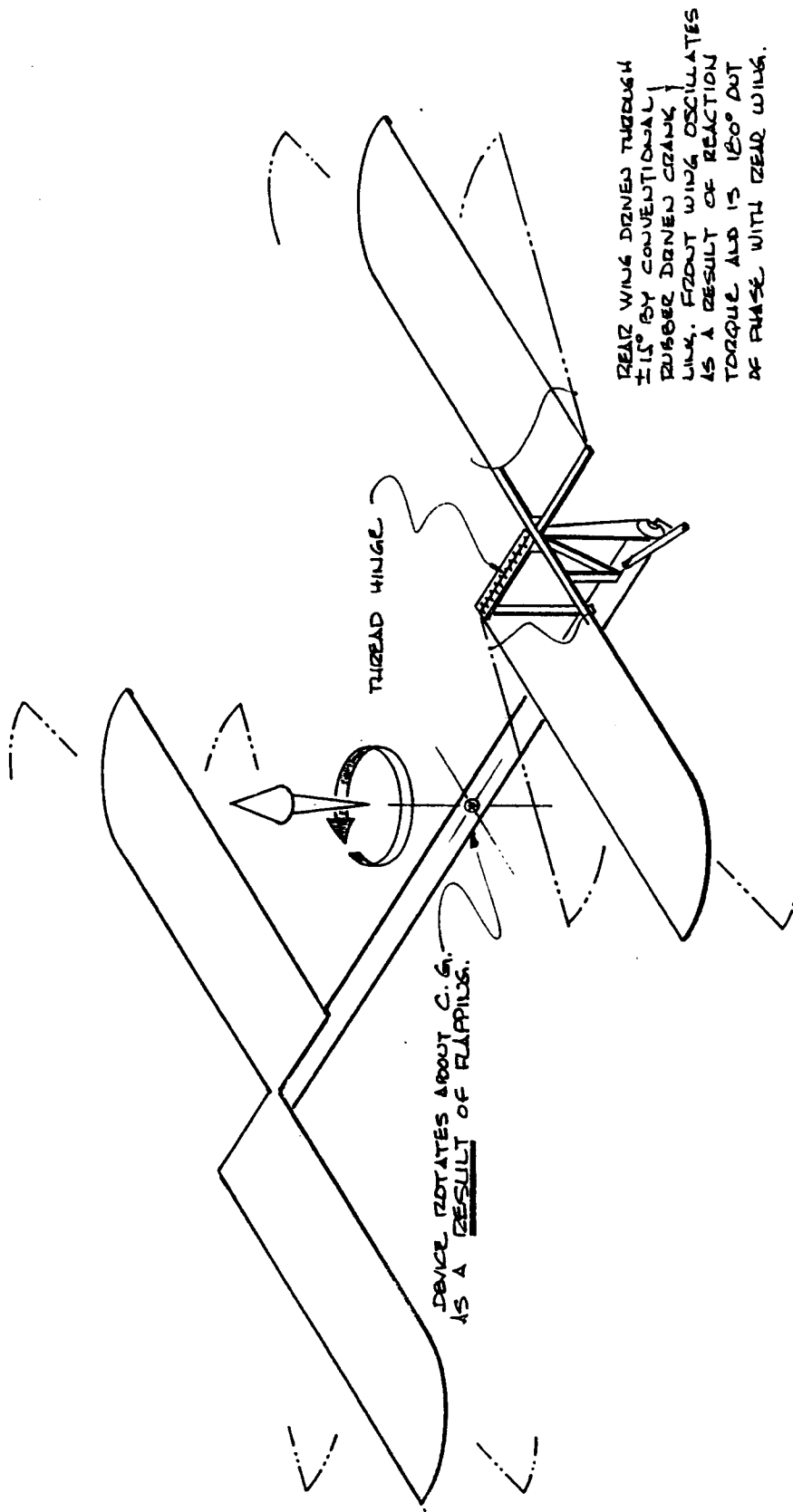
On one hand I wish we could claim a big breakthrough for the flapping argument. On the other hand, someone out there may have tried to get something out of the idea and has some suggestions to offer. But, Jack and I both have convinced ourselves that there might be some aerodynamic merit to be investigated. We would hope that by presenting things as we have investigated them to date, others in the OMS might choose to critique the situation. Good or bad, we will welcome any thoughts, ideas, or suggestions.

Now, let's see. I am considering a modification for Ornicopter 1, #5 that will guarantee success. As soon as I can figure what that modification should be, I'll build 'er.

So there,

A handwritten signature in black ink that reads "Dick" with a stylized flourish extending from the end.

Dick Johnson
3815 Weeburn Drive
Dallas, Texas 75229



OrniHopter/HeliCopter I

DESIGN: DICK (HALF SERIOUS) JOHNSON 2-16-87

CAUTION: TO DATE, MODELS ROTATE BUT WILL NOT CLIMB. 4 VERSIONS HAVE BEEN BUILT WITH APPROX 20 SPAN & PROPORTIONS SHOWN.

Question & Answer by Frank Kieser

I recently received an interesting letter from Jonas Romblad in Sweden. He had some interesting questions which I will try to answer.

1. How do you think size of an ornithopter affects duration?

A - Although there have been theories that there is an optimum size ornithopter, my opinion is that for biplane ornithopters the bigger the better as long as the wing loading does not increase with size. I started with a 14" span and have increased it several times until my most recent design is a 24" span. The performance has steadily increased although I must say that improved building techniques may also have contributed. I plan to increase the size for my next season's model.

2. Since all sites I fly are cat. 1, I wonder how a low ceiling flapper should look?

A - Of first importance is to minimize sinking speed after the cruise by minimizing weight. The rubber should be sized so that when fully wound, it will just take the model to the ceiling and keep the wings flapping until it returns to the floor. The weight of rubber thus sized can be $1/2$ to $2/3$ that required for a high ceiling. The lighter loads resulting from less rubber weight and torque can result in lower structural weight. A dead stick glide is usually very steep and should be avoided.

Second, the climb can be minimized by adjusting the incidence angle of the flappers. Since the flappers provide the thrust, this is like adjusting the thrust line of a prop plane with up thrust or down thrust.

3. How big an ornithopter could a 0.4 h.p., 100 to 150 rpm powerplant support?

A - I am afraid I can't help much with this one. As you know, we still have a prize offered for the first powered ornithopter. It is an interesting problem and I hope some day I will get to working on it. One possible approach is to build a heavy rubber powered craft to get data that will help us estimate the power, wing loading and flap rate requirements of large, heavy ornithopters. It would be interesting to hear from anyone who has done some work in this area or has any thoughts about it.

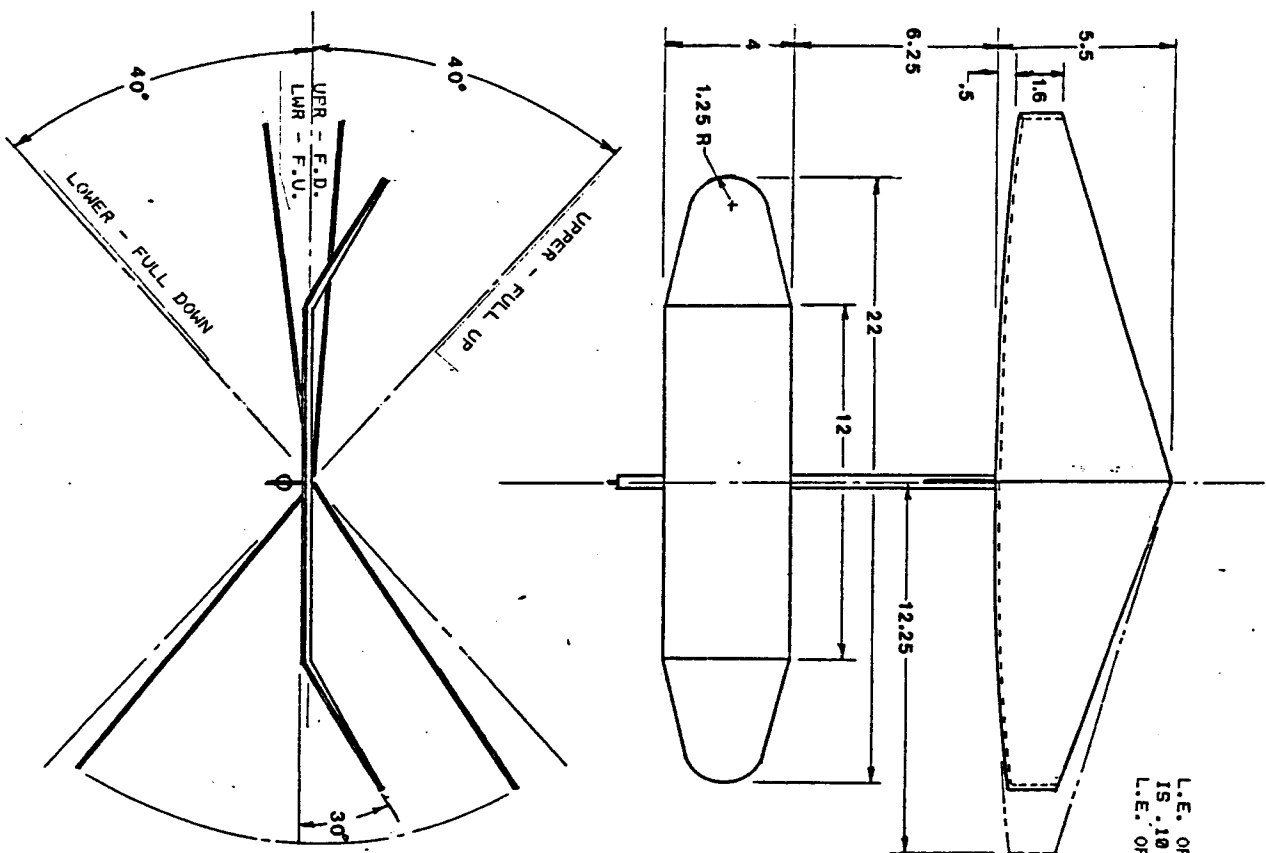
UNITED STATES INDOOR CHAMPS

The USIC was held on June 5 to 7, 1987 at the Minidome at East Tennessee State University in Johnson City Tenn. There were about 100 contestants and it was one of the biggest and best indoor meets in recent times. The site was outstanding with a 120 foot ceiling and a floor the size of a football field. The girder ceiling was treacherous and the few models that got hung up there were difficult to retrieve. Some may object to this, but I don't. One of the skills of indoor flying should be to cruise just under the ceiling without touching it. Winners should not be determined by lucky bounces off the ceiling. The campus was beautiful and the dormitory accommodations were very good.

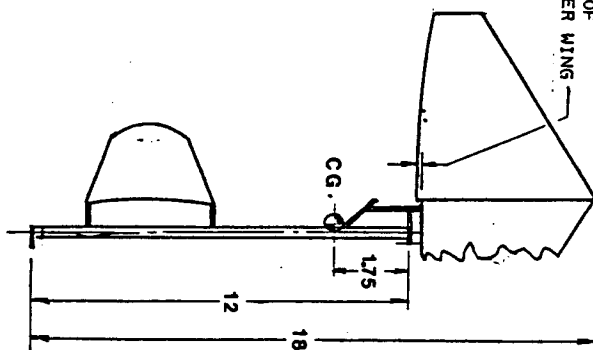
The ornithopter event was on the afternoon of the first day with a field of nine contestants. The order of finish and times were as follows:

1. Frank Kieser - 10:33, 2. Les Garber - 7:02, 3. Jurgen Kortenbach - 6:44, 4. Rex Powell - 5:55, 5. Joe Krush - 5:11, 6. Doug Barber - 3:18, 7. Terry Hreno - 2:33, 8. Hewitt Phillips - 2:26, 9. P. Steahling - 1:36. Unfortunately, Roy White had entered but was unable to make it due to illness in his family.

The evening after the competition there was an informal ornithopter discussion lead by Les Garber. It was attended by most of the contestants and also by Walter and Dave Erbach. A good time was had by all.



L.E. OF LOWER WING
IS .10 AFT OF
L.E. OF UPPER WING



FANCY GIRL III

CANARD PUSHER ORNITHOPTER
BY FRANK KIESER

WING AREAS (SQ IN):

UPPER WING FLAPPING 87.2
LOWER WING FLAPPING 82.6
TOTAL WING FLAPPING 169.8
TOTAL WING FIXED 0

PROJECTED FLAPPING

169.8 X COS 28° 159.6
STABILIZER AREA (SQ IN) 77.3
STAB./PROJ. FLAPPING (%) 48.5
WEIGHT - 1.31 GRAMS

POWER - 18 IN LOOP PIRELLI - 1.19 GM
COVERING - HARLAN "ULTRAFILM"
NOTE - ALL WING AND STAB. DIMENSIONS
ARE FLAT PATTERN

BEST TIME - 8 MIN. 28 SEC. (CAT III)

ROTUNDA OF COLUMBIA UNIV. LIBRARY
APRIL 19, 1987

-10 MIN. 33 SEC. (CAT IV)
ETSO - JUNE 5, 1987

