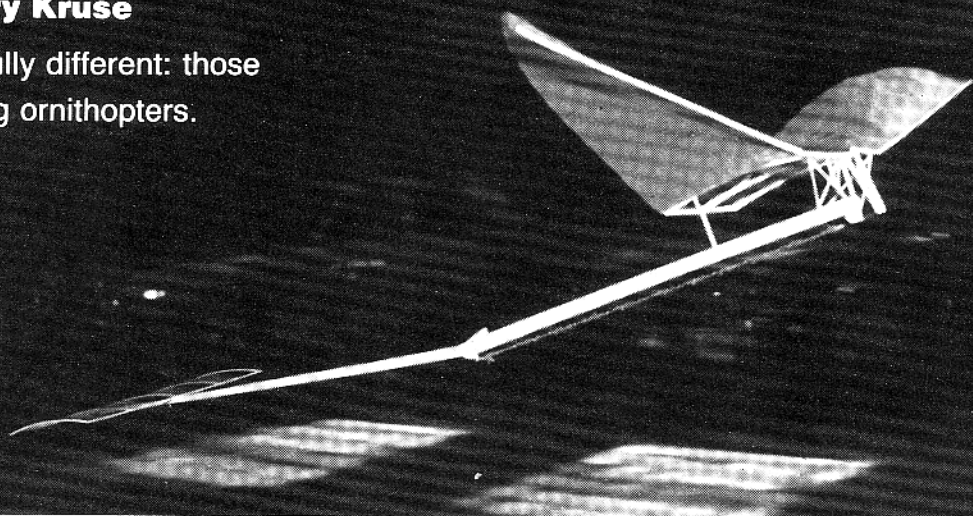


What's all the flap in Oklahoma City?

By Larry Kruse

Delightfully different: those intriguing ornithopters.



PHOTOGRAPHY LARRY KRUSE

The focal point of this article, Roy White's *Rara Avis*, begins its climb to the ceiling. Due to the crank rotation, the flapping arc of each wing is not simulta-

neously equal. Note how the condenser paper "feathers" allow air to spill out the trailing edge of the wing.

As a highly competitive indoor free flight club, Oklahoma City's Sooner Free Flight Society (SFFS) is to indoor what Charlie Brown is to kite flying. As SFFS leader Bill Baker says: "We're just a bunch of outdoor fliers waiting for better weather".

Despite their avowed lack of tooth-and-nail competitive drive in indoor, the SFFSers do stage several indoor fun-flies and a minimum of one sizable indoor contest each year, usually just prior to the start of outdoor flying. An integral part, indeed, the highlight of

these late winter contests for the past few years has been the inclusion of an ornithopter event, one of the few in the entire nation, outside of those held in conjunction with major national contests.

For those who have never seen an ornithopter in flight, Ron Williams probably describes it as poetically as possible in his definitive, *Building and Flying Indoor Model Airplanes*:

"This type of aircraft generates a great deal of excitement when flown. The sight

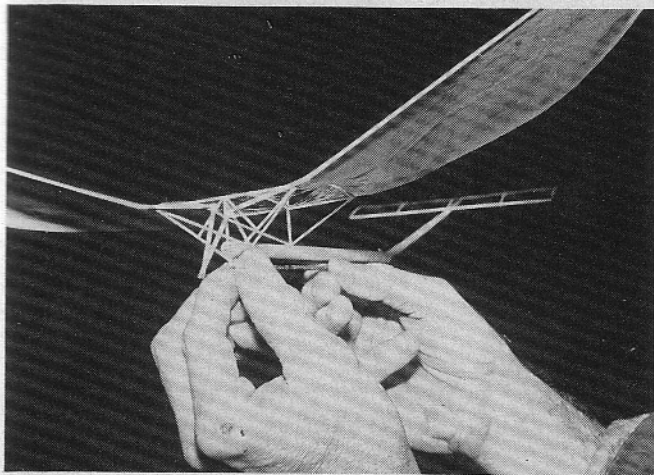
and sound of an aircraft flying by its flapping wings is so powerfully evocative of the flight of birds (or bats) that one is drawn into rapt attention as the flight begins. As the flight ends, a certain pathos accompanies the aircraft to the floor as one sees the end of its short effort. Those who build and fly the ornithopters do so infrequently; the craft are technically complex and the poor things tend to be torn to pieces in the event of a major component failure. Once the flapping mechanism is sent into a state of imbalance, the resultant eccentric forces tend to wind the plane up on itself."

Not to disparage Ron's description in the slightest, we should note, however, that there have been some major advances in ornithopter flight in the last few years. The "short effort" has now become a commonplace four to six minutes plus for several fliers, including the focal point of this piece, Roy White of Catawissa, MO. As a multiple National Record holder, (Cat. I—3:55; Cat. II Outdoors—6:38; Cat. III Outdoors—6:00) Roy flies finely tuned flapping machines that barely seem to oscillate as they climb toward the ceiling. Weighing as little as .024 ounce and using small sections of hypodermic needles as the bearings for each flapping surface, Roy's *Rara Avis* design is an extremely smooth flying craft of relatively simple construction, easily trimmed.

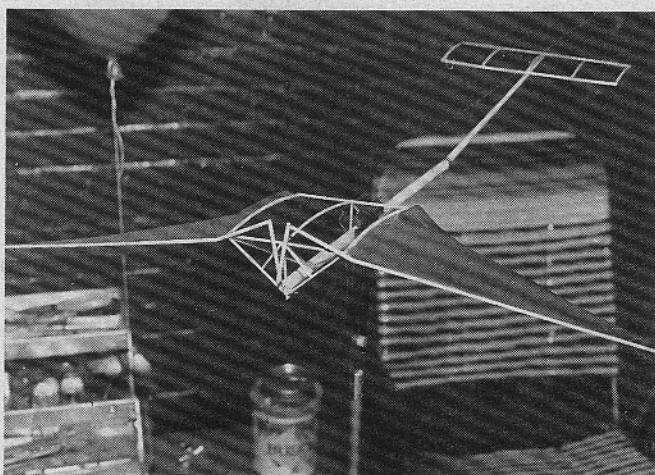
Hopefully, the photos will relay a bit of the spellbinding and intriguing qualities intrinsic in the nature of this altogether different form of flight. For those readers who wish to learn much more about the finer points of building and flying the elusive ornithopter, there is a national organization called the Ornithopter Modelers Society (OMS), devoted entirely to that segment of our hobby. More information about OMS can be obtained by writing to Roy White, Rt. 1, Box 241, Catawissa, MO 63015.



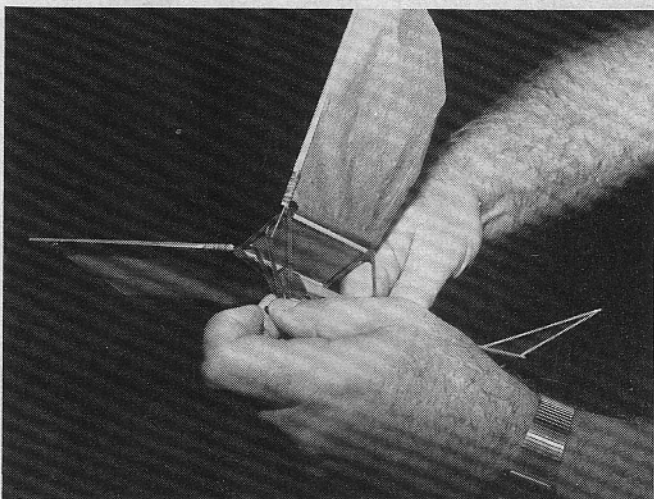
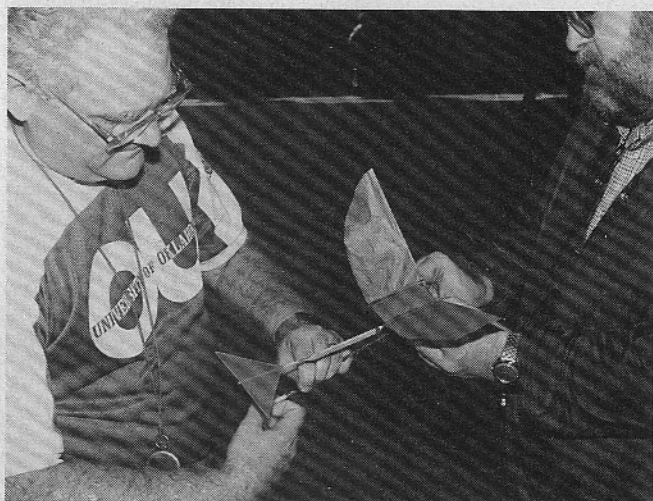
Our author, Larry Kruse, and his first ornithopter, a design by Ken Johnson called *Birdy*. The design itself is archaic looking because it was based on a sketch by Leonardo Da Vinci. The wing "ribs" are threads secured to the underside of the condenser paper with cement. Craftsmanship absolutely essential.



This maze of balsa sticks is really the flapping mechanism (above left) of an ornithopter. As the crankwire rotates, the conrods move around with it causing the wing spars to move up and down. Simple, isn't it? To give you an idea of the range of wing movement up and down, compare this photo (above right) to the photo to the left which shows the wings about halfway through their upward motion. Normal movement is about 44° . Bill Baker and an unidentified helper



prepare Bill's ornithopter for flight (below left). It's from a kit of Japanese origin called the *Hummingbird* being distributed by Hobby House. A closer view (below right) of the cabane assembly and flapping mechanism of Baker's *Hummingbird*. Mechanism primarily made of pre-formed plastic and music wire. Flight was extremely fast, with aerobatic, darting tendencies. Wing covering was tissue paper as was the stabilizer.



Shirley White uses a calculator (above) wired to her husband Roy's winder to keep track of the number of winds put into his *Rara Avis*. Holder of multiple national ornithopter records, Roy (at left) poses with an indoor version of his *Rara Avis*.