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The Manhattan Cabin

Manhattan Cabin is the creation of Ed Whitten. Ed longed to see a semi-scale model of generous proportions flying indoors. He defined a class with a set of rules in 1965 and described a prototype of the plane. It was first published in *Indoor News and Views* in November 1965, and subsequently in *American Aircraft Modeler*, April 1968. The first examples of a Manhattan were built at an RCAF base in Gypsumville, Manitoba, by Dick Percy.

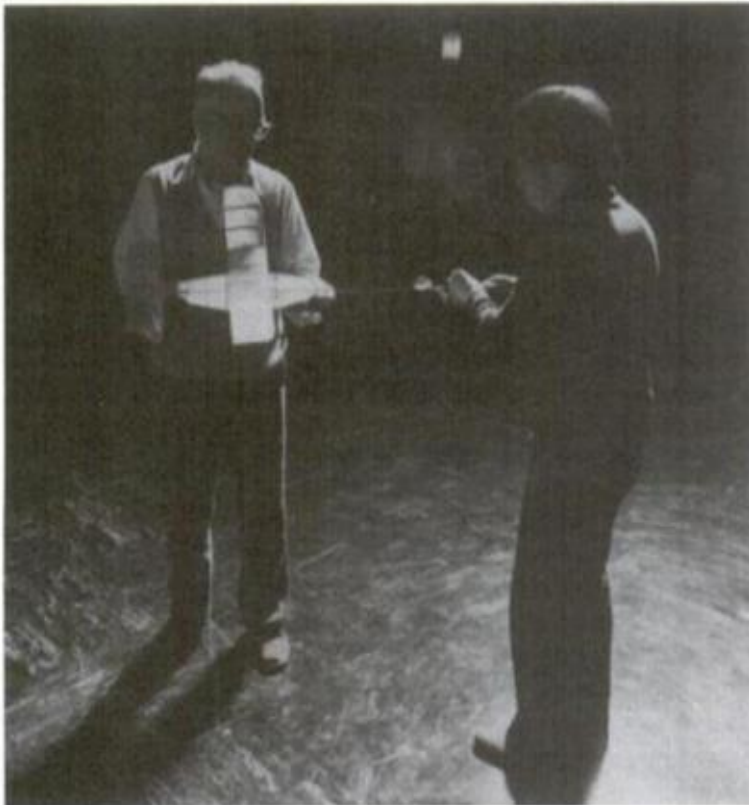
The first planes were limited to a minimum weight of 0.3 ounces (metric equivalent: 8.5 grams) including rubber, and had to have a fuselage which would enclose a box 2" x 3" x 5"; no maximum fuselage length was specified. For monoplanes, the maximum wing size was 4" x 20". Maximum stabilizer dimensions were 3½" x 8". There were other restrictive rules intended to give the class a somewhat realistic design and to ease the contest director-contestant relationship.

Ultimately, members of the Miami Indoor Aircraft Model Association (MIAMA) rewrote the rules and sponsored an event using the new rules at the 1976 National Model Airplane Meet, held in Dayton, Ohio. The class was immediately popular, and attracted builders all over the U.S. and in England.

The current rules require:

1. An airframe weight, less rubber, of a minimum of 4 grams.
2. A maximum overall length of 20", exclusive of the propeller.
3. A fuselage which supports and encloses a single rubber motor (without a motor stick), with space to include a box 2½" x 4" x 2" (no diamond shapes) and a windshield of a minimum of 2 square inches and a window on each side of 1 square inch minimum area, covered with cellophane or similar material.
4. The propeller must be of solid wood, direct drive and fixed pitch.
5. The wing must be an unbraced monoplane with a maximum 20" wing span and a 4" chord.
6. The stabilizer must be no more than 3½" wide or 8" in span.
7. The landing gear must be rigid and fixed and

Photo credit: Stu Chernoff



Ed Whitten holds his *Riversider* as his son, Richard, winds. Columbia, 1977.

able to support the plane, with 1" minimum diameter wheels (2).

8. The covering must be of paper (not film or Micro Lite) except for the windshield or windows.
9. In competition the plane must fly ROG (rise-off-ground) and may be flown in unlimited attempts (flights under 20 seconds) to record 5 official flights. The best flight counts.

These rules have been used with minor changes by groups of indoor flyers all over the U.S. Rules are, generally, the predominant subject of discussion when model builders congregate on a competitive basis. The Manhattan's rules are no exception. Since many planes meeting these standards have been built, it is likely that the weight of opinion will be in favor of maintaining the present rules.

The first time I saw a Manhattan was at Columbia University's Low Library Rotunda. It was Ed Whitten's *Riversider* and it seemed gigantic. I couldn't help but think of it as an Old-Timer, and found myself looking up into the dome to reappraise the space in terms of this great clunk of a plane. Richard, Ed's son, wound as Ed held the plane—the rubber seemed enormous—and I wondered. It took off quite gracefully and began a dignified climb toward the high arched windows into the streaming sunlight.

I was distracted momentarily by another flyer, and then turned to Richard to ask where the plane came down. His reply, that it was still flying, astounded me. I was used to anything resembling the Manhattan, such as a large indoor scale model, returning to the floor after, at most, a minute of flight. Indoor had previously meant planes that were hardly there or hardly up. But the *Riversider* (figure 7-1), at more than 10 grams and what seemed great bulk, was up for well over two minutes. It was something new, visually exciting and, with what I'd heard of other, lighter versions, promised more excitement with longer flights.

My first Manhattan was designed to attempt to give the form character through relating it to some abstract, animalistic form. I realized that I

needed some experience with the type before I could intelligently begin building to weight. I decided to build as lightly as practically possible, but to put some fun into the design, perhaps at the expense of performance. The plane was a complete success in terms of the interest it generated as well as in its performance. Its development and the details of its construction are described in the October 1977 issue of *Model Builder Magazine*.

The most successful Manhattans have been conventional in their design. John Triolo's *Skyscraper* (figure 7-2), with its polyhedral wing up on posts and its large, slow-turning propeller, is capable of times aloft in excess of 10 minutes. It is a joy to watch as it slowly circles an indoor space. Bill Tyler's *Patchogue Invader* is another plane finely crafted in the indoor tradition as is Bucky Servaites' *West Baden Winner* (figures 7-3, 7-4).

The plane described here, the *Columbia II*, was developed as an attempt to define the requirements for a successful, stable airframe which could serve as the basis for experimentation. The design development started with an attempt to get more out of the fuselage volume requirement (i.e., a 2" × 4" × 2½" enclosed space) by laying it out flat in an airfoil shape. The rules do not specify whether the required volume should be standing up or lying flat and so a lifting or Burnelli-type fuselage was a logical subject for exploration. The Burnelli type presented many problems, but the horizontally oriented fuselage seemed to provide some lift, and the turning drag seemed less. However, the conventional fuselage design was chosen for ease of construction.

When I built my first Manhattan, *Yeloise*, I weighed each component uncovered and then finished. The finished plane weighed 4.4 grams. In the process of adjusting the plane, I removed and replaced the tail cone and rear tail "feathers," and by building much lighter, I brought the weight down to 4.21 grams. When I built the second plane, the prototype of the *Columbia*, I discovered I had misplaced the records of the first plane and had to start over.

I decided to "punt," trying to intuit what it would take to make a 4-gram plane. I left the