

The Mark I was specifically designed to take advantage of the 1963 AMA rule change allowing the use of multi-channel or proportional radio systems in Class I.

Prior to this change in rules, you will recall the rudder only model as a small craft of 300 to 400 square inches of wing area, powered by a .15 to .19 cubic inch engine, a single channel super-regen radio system linked to a compound escapement providing only limited power to move the rudder surface. All of this added up to quite a package to keep flying during the demanding contest season!

In the fall of 1962, when the current rules were still in the proposal stage, I decided to work out a basic design configuration that I would use if the new rules did materialize. Here are the features I wanted for the approaching (1963) contest season:

1. A craft strong enough to utilize the .45-.49 cubic inch engines being used so effectively by Class 3 flyers. With this size engine one can expect a dependable low idle with the power at full throttle that's so important in Class I competition.

2. A design large enough to accommodate the heavier engine and radio equipment, while at the same time maintaining the proper wing loading.

3. Good ground handling characteristics.

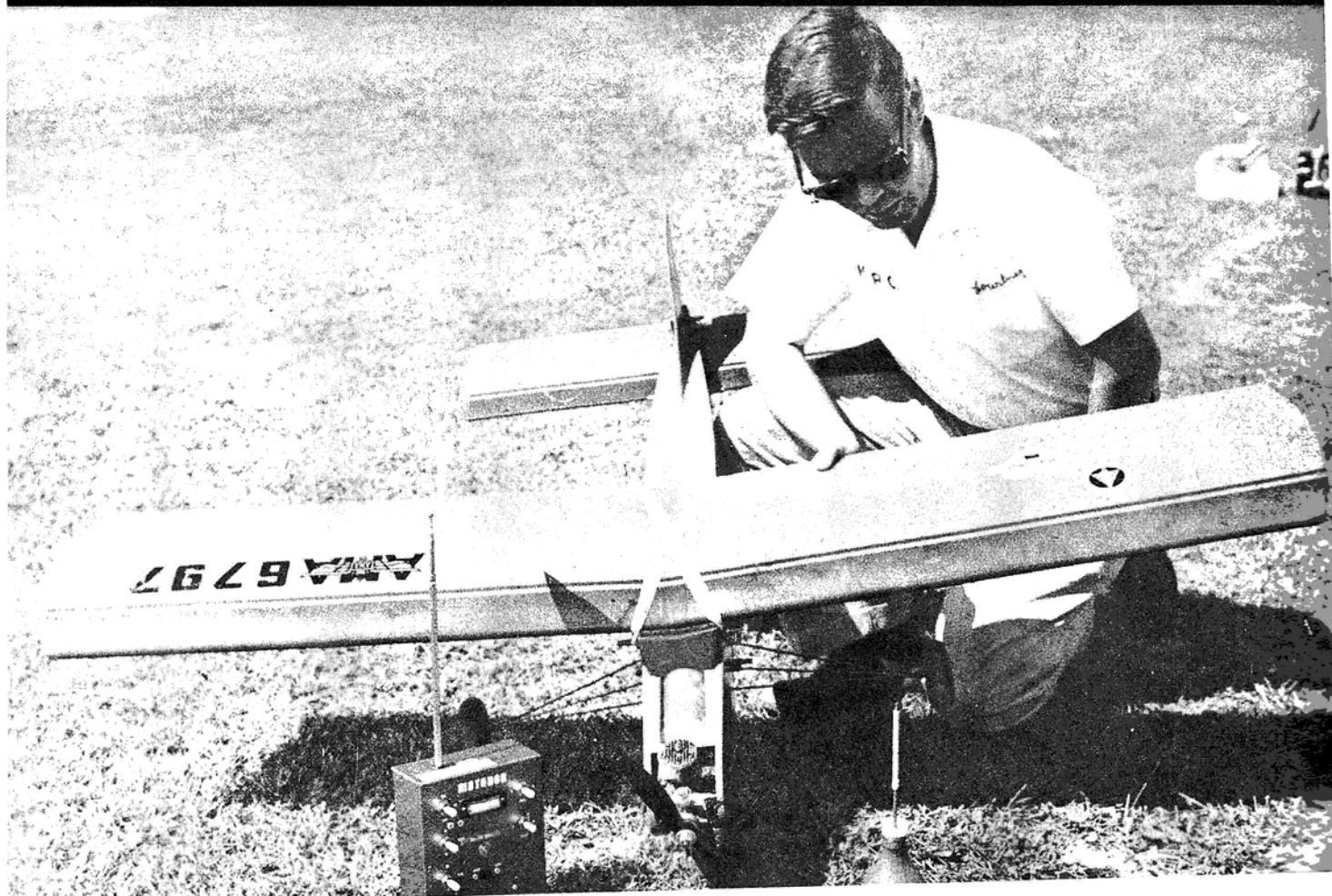
4. A plane with all the above, plus the ability to perform well acrobatically and penetrate our strong midwestern winds, ever present at contests. Our final aim was a design that would be easy to build, with a pleasing semi-scale appearance and finally to be strong and able to take the rough treatment and flying mistakes that sometimes grounds other planes.

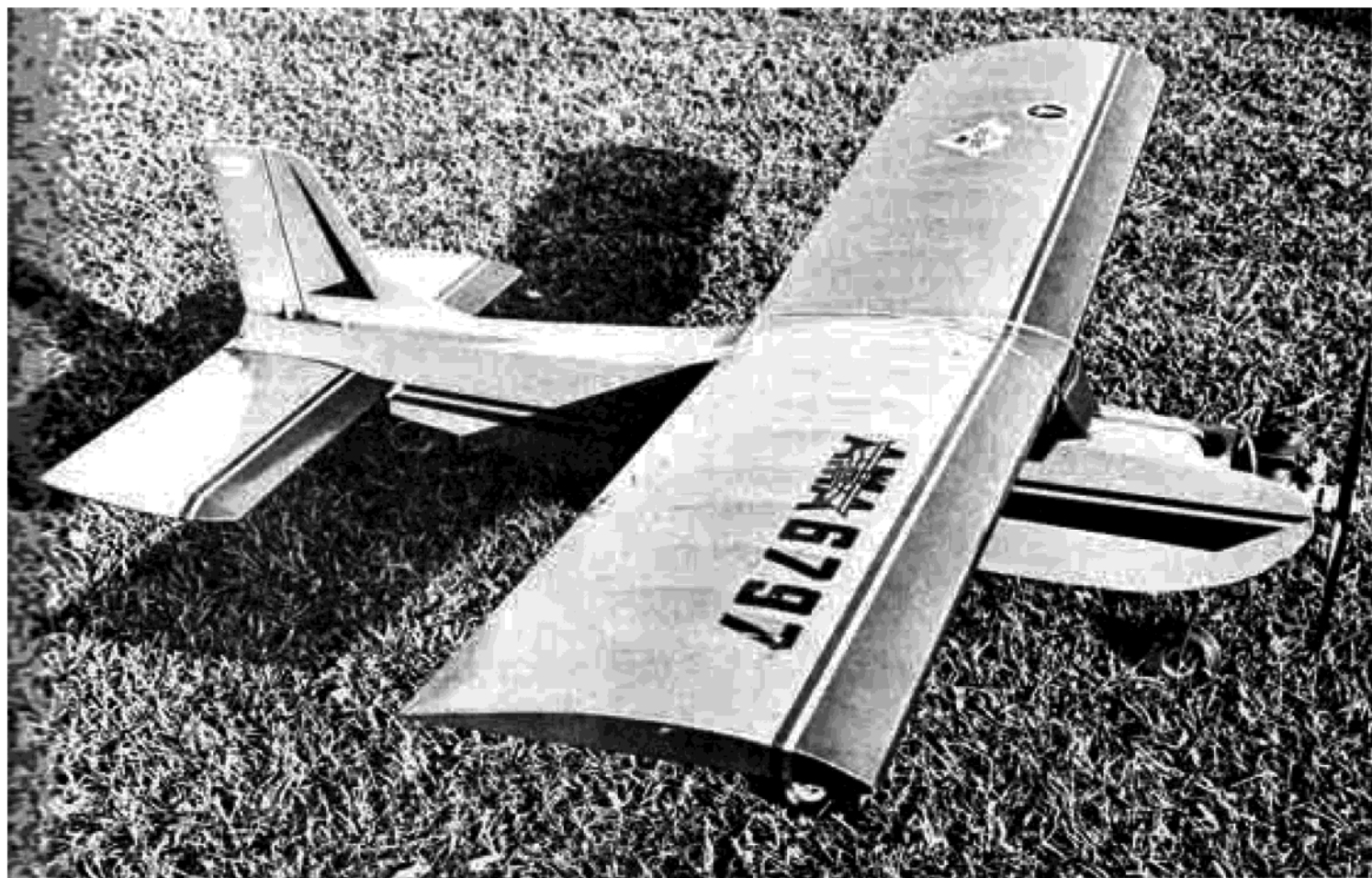
The design was completed during November of 1962 and test flown during the winter months that followed. The Mark I exceeded all my hopes during these innumerable test flights.

The use of up-thrust in the engine has really proved to be a big help in Class I flying. With a .45 engine, the Mark I will pull into loops and other similar maneuvers without the usual spiral dive to gain the zoom speed, and yet at a fast idle the Mark I will penetrate a small gale. During the touch and go and landing maneuvers, a tap of engine speed just before touch down will bring up the nose

# THE MARK I

## Top Rudder Only Design For Total Contest Per





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by  
**Courtney  
Smith**

and flare out the approach for a nice landing. The up-thrust is used exactly like an elevator — low engine down, high engine up. This feature certainly gives the flyer a nice feeling to have the effect of an elevator in Class I.

You will notice the placement of the main gear is exactly under the model's CG. I have found that this set up makes ground steering and take off corrections much easier. The model will steer, even with the fixed position nose wheel, since the nose wheel is actually bouncing with very little weight on this wheel. On take off, the Mark I will respond very nicely to rudder corrections with this gear set up. A small drag brake on the nose wheel fills the bill on the full stop required for Proto Taxi. The wide track main gear helps keep the plane on its wheels during the taxi maneuvers and also is a big help on the landings in gusty winds.

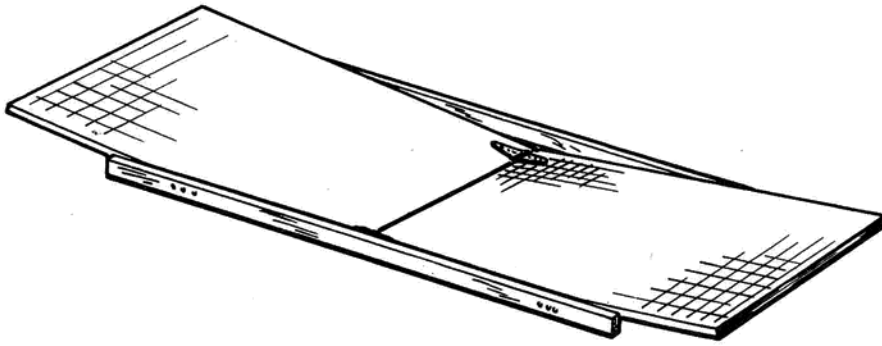
With the large rudder area on the Mark I when you need a lot of action for spins, rolls, etc. you have it, however for gentle pattern turns a pulsing command is a must. The Mark I will stay in a shallow turn once the turn is started and a short heep of opposite rudder will straighten it out. True spins are easy to perform, but must be started under full power from a complete stall. Our spin record to date is 104 turns with the Mark I set at the 1963 Omahawks contest after official flying had stopped for the day.

Several of my fellow KC/RC members have built the Mark I design and have had real success with the plane both in contest work and general sport flying. Last year the Mark I placed first in ten contests with many seconds and thirds. Some of the places were by fellows flying rudder for the first contest season.

I think your first flying day with your Mark I will prove to you that Class I flying has a lot to offer for all builders and is a real challenge for the competitive flyer.

I have had a lot of help in developing this design, mostly in ideas from my fellow KC/RC members and many contest flyers from the mid west. My thanks to all of them.

I'm sure you'll agree that Class I flying has really changed in the past season.



*Fast, easy to build, and versatile wing jig is the key to true construction, perfect alignment. Details included in article.*

the top i.e. sheeting and the top cap strips. Complete the top center section sheeting and the sheeting on each wing tip. Be sure to extend the tip sheeting past the last wing rib so the tips can be completed after the wing is lifted off the jig. Complete the tip by gluing the  $\frac{1}{8}$ " tip plate in place (a tip block could be used here, but I find a

to prevent warps. The rudder and fin are cut from  $\frac{3}{16}$ " stock. Using the new plastic hinges on the rudder has proved to be a real improvement over the old type sewn hinge — both in appearance and freedom of action. The .020 thickness seems to work best for this size of rudder area. Notice the fuse top is cut to accept the fin. The fin extends through the fuse and is braced inside the fuselage. This method prevents breaking the fin off the fuselage in case of flipping the model on its back.

Fuselage sides are cut from  $\frac{1}{8}$  x 6 x 48 hard balsa and should be cut as a pair to avoid misalignment. Glue in the doublers, motor mounts, and drill all the dowel holes. Add formers F-2 and F-3, and when dry, pull in the nose section and add F-1. Then pull in the tail section and complete the top and bottom sheeting with  $\frac{3}{32}$ " stock.

We used silk on the wing and stab and gas model silkspan on the fuse and rudder. Three coats of clear dope and two coats of colored dope complete the job.

Our Mark I uses a Veco .45 for power, using a 11" x 6" prop, a 6 oz. C&M clunk tank, F&M Midas-Matador radio equipment. The weight ready to fly is  $6\frac{1}{2}$  lbs.

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*With the amazing array of trophies behind it, the Mark I may be top Class I contender at the 1964 Nationals.*

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is noted on the plans. I have used this method for some time and it definitely cuts building time to a minimum and always produces the true wing so important in RC work. Carl uses a 6'6" x 1'6" hollow core house door, which usually can be purchased from a damaged freight dealer for under \$5.00. Saw the door in half and, using two strap hinges, set the dihedral angle. Brace with 1x4 strips to hold the angle. This jig will set flat on your work bench and can be moved to other areas in your shop while the glue is drying. Most of the fellows rule the surface of the jig with a ball point pen with 3" grids since most wing rib spacing are 3" or can be modified to 3" spacing.

I make the wing first since this seems to move the fastest in construction and also can be put aside to age while the other major parts are under construction. After cutting out the required number of wing ribs from  $\frac{3}{32}$ " firm stock, pin down the bottom i.e. and t.e. sheeting, the bottom center section sheeting, the bottom spruce spar and the  $\frac{1}{4}$ " x  $\frac{5}{8}$ " leading edge (straight stock here to avoid warps). The bottom cap strips are glued into place to complete the bottom surface of the wing. Now add the wing ribs and the dihedral braces. These braces are made of  $\frac{3}{32}$ " plywood. The area between the spars in the center section is filled with hard  $\frac{1}{4}$ " sheet cut to fit. Also a  $\frac{3}{32}$ " plywood dihedral brace is doubled across the i.e. section. Now the top spruce spar is glued into place along with the top t.e. sheeting,

built up tip is easier and takes less time to complete).

The stab can be built on one panel of the wing jig. Block up the i.e. and t.e. the necessary amount and add ribs and all sheeting. Again select firm straight stock

I have had a great deal of pleasure developing this design and real satisfaction seeing other fliers have good luck with the Mark I. Best of luck to you when you fly yours.

*The Mark I, one of the finest, all-time Class I designs, and a top competitor under the new rules.*



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