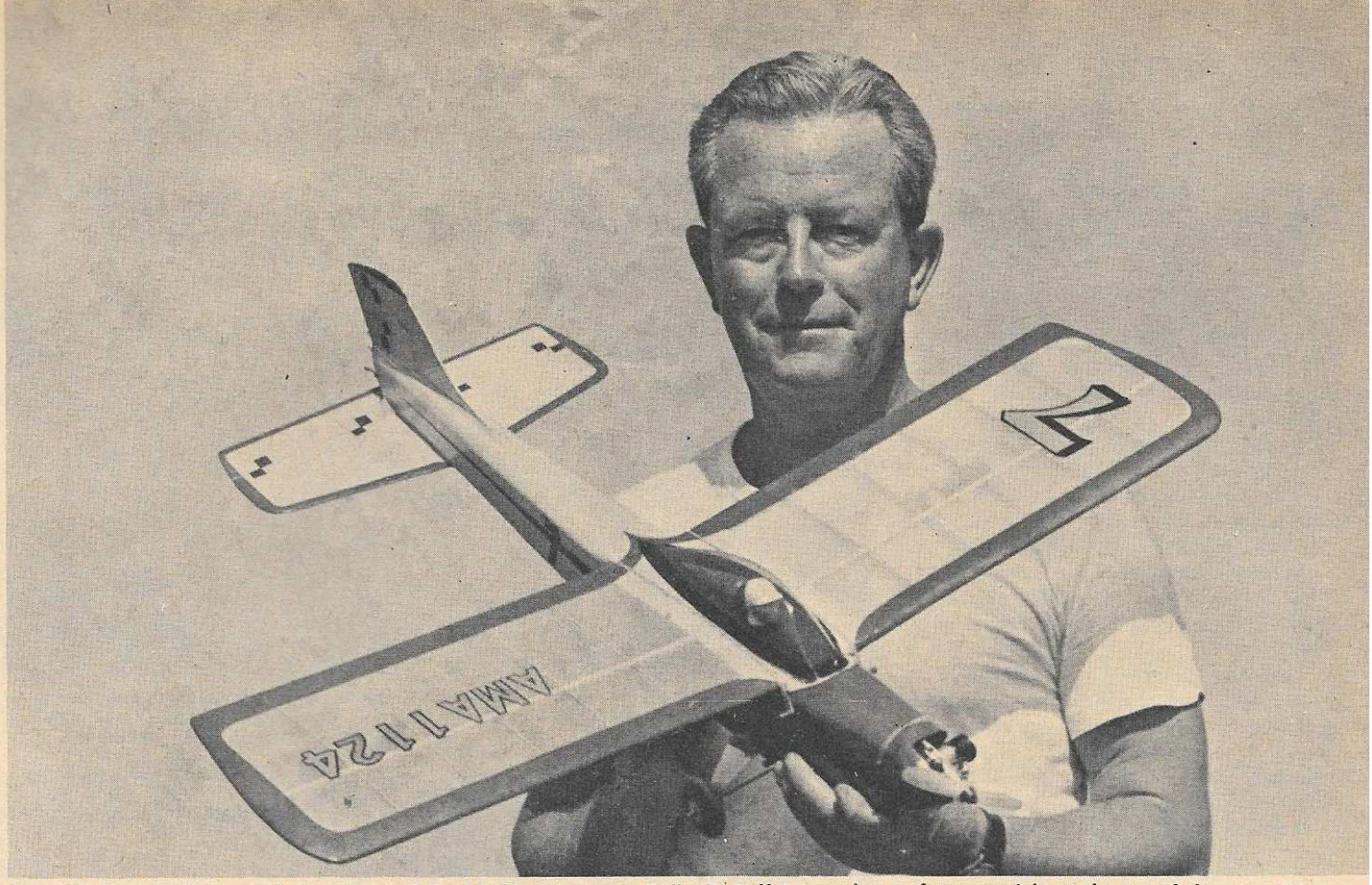

Pop with the new little one. Designed around the F.A.S.T. pylon rules. Willard's Half-A racer has performance right at the top of the competition.

THE SCORCHER

by KEN WILLARD

BEEN THINKING ABOUT R/C PYLON RACING—IF SO, OUR TOP SMALL R/C MAN HAS COME UP WITH A REAL 1/2A HOT-ROD. REPORTS FILTERING FROM WEST COAST SAY IT REALLY MOVES.

Careful attention to details makes the little racer a standout in any collection of model planes. Clean functional lines as well as highly polished surfaces add to its performance.

► Are you a good radio control model flier? Can you "sense" what your model will do if it starts to "go ape"? If not, then get a "test pilot" for your first flights with this new 1/2A pylon racing design. It's not for a beginner—in straightaway flight it has been officially clocked at 50.4 miles per hour, and that means it will be hitting around 65 mph in some diving maneuvers. Now, when you fly a 32" model that fast, you know you've got a real Scorcher on your hands!

Many of you regular readers of M.A.N., on looking over the photos and plans of the Scorcher, will observe a close resemblance to the .09 Gasser which was published in M.A.N. in 1959. That's true; the Scorcher is a modification of the Gasser design, reduced for the smaller engine, but with certain appearance requirements intended to enhance the interest in the new proposed 1/2A pylon racing class.

Before we go into the construction and flying characteristics of the Scorcher, let's talk about 1/2A pylon racing for a minute.

Do you recall the tremendous shot in the arms that free flight modeling got with the introduction of the 1/2A engine? Similarly, it is already evident that the new small transistorized radio receivers like the F&M Pioneer, Citizenship LT-3, C&S-501, and others, operating on 3 volts, open up a new market in radio *(Continued on next page)*

THE SCORCHER ... Continued

control flying—one that will mushroom in volume.

Along with this great increase in small radio control models, there should be some competitive events for the fliers. It is not practical for the small jobs to compete against the big, beautiful, and expensive multi-channel planes.

Precision flying in the 1/2A class will come along, but this requires judging—with all of the human factors involved.

1/2A pylon racing will require a course and rules, but once these are set up, the winner is established by an impartial stopwatch—or by being first across the finish line. There are no estimates of smoothness, or guesses as to loss of altitude or angle of recovery. You're either first or fastest, and that's it.

But we shouldn't overlook the TLC (tender loving care) factor. The painstaking modeler should be rewarded. Also, to create the illusion of realism, the model racers should look like little men are flying them. So, we set up a minimum cross section which woud accommodate the body of a scale pilot—not just the head the shoulders.

With the foregoing factors in mind, here are some suggested rules for 1/2A pylon racing radio control models. As we gain experience, these rules can be modified—but we have to start somewhere.

RULES FOR 1/2A PYLON RACING

A. AIRPLANE

1. Engine Displacement .....049 maximum
2. Wing Area, 250 sq. in. minimum
3. Fuselage Depth, 4½" minimum incl. canopy)
4. Fuselage Width, 2½" minimum (Widest point)
5. Wheel Diameter, 1½" minimum (Fixed L.G. required)
6. Must have pilot in cockpit, cabin, or under a canopy. Head size 1-1/3" chin to top of head (minimum).
7. Registration no. on upper right, lower left wings and both sides of rudder.
8. Racing number upper left, lower right wings and both sides of fuselage.
9. Appearance points to be awarded for craftsmanship and detail. Airplane must fly in same contion as judged.
   a. Engine cowl .....0 (no cowl)—10 (full cowl)
   b. Wheel pants .....0 (none)—4 (full)
   c. Pilot compartment .....0 (head only)—15 (full pilot, seat, dash, controls, headrest, etc.)
   d. Finish .....0 (crude)—+15 (high gloss)
   e. Decor .....0 (plain)—10 strikingly unique
   f. General appearance .....0 (plain)—8 (fillets, joints, buried mounting attachments, etc.)

B. RADIO

1. Unrestricted

C. COURSE RULES

1. Two pylons, 264 feet apart (1/20 mi.)
2. Race to be 1/2 mile (5 laps)
3. Flight to be around pylons to right or left at flier's choice. When two or more are flying together, left hand course will be flown, unless full agreement is reached to fly right hand course.
4. Starting line will be line at right angle to course line, passing thru downwind pylon.
5. Insofar as practical, course will be laid out parallel to prevailing wind, to give one upwind and one downwind leg.
6. Finish line will be same as start line, with airplane rounding downwind pylon and crossing finish line in upwind direction.
7. Start will be ground takeoff unless course condition does not permit, in which case hand launched start will be permitted. Records will only be recognized in the former instance.
8. Two minutes will be allowed

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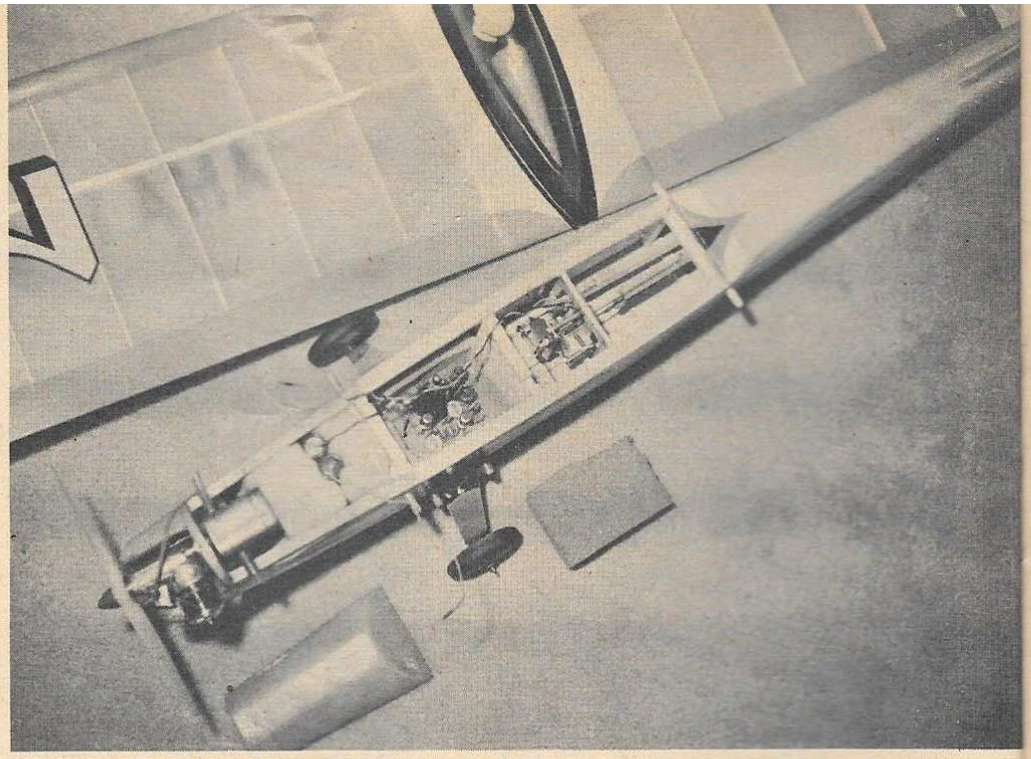
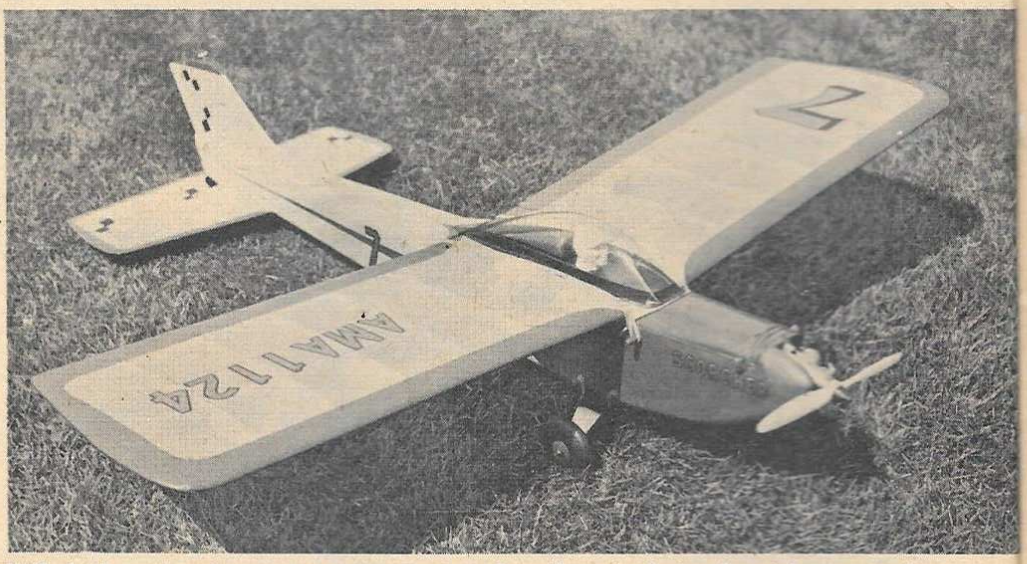


A look on the inside of the Scorcher shows component placement as well as roominess of the fuselage. Use of the CG Pioneer 3 volt receiver contributes to weight and size reduction.



Half cheek cowl and engine on side clearly shown in this photo. Elastics across top at firewall retains fuel tank and battery cowling. Black squares on stab & rudder are hinges.

The Scorcher

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for starting engine.

9. Airplane must land undamaged (except for broken prop and/or minor scratches) within 3 minutes from takeoff.
10. Flier may move forward 100 ft. from start line *after start*, if desired.
11. Flier may have helper at start, but must fly the course unassisted, judging his pylon turns without any flagmen at pylons.
12. Pylon judges will rule whether airplane has cut pylon and so indicate by waving red flag, in which case airplane must return and go around pylon again, in the same original direction.

Okay. We've set up the general purpose for which the Scorcher was designed. I've given you a little warning about the test flying period. The reason I limited the warning to the test period is simple—once you get the Scorcher trimmed out, it is completely stable and handles very reliably—although it still is very hot and responsive. It is only during the trimming out phase that you have to watch it, since it does pick up speed so fast in a nose down turn. So now let's cover some of the construction.

First off, you may be inclined to gripe a little on the lack of detail in the plans. Simmer down, now. They're that way on purpose. Frankly, I don't want any beginners building this design. It is deceptively easy to put together the basic structure—and this could lead to a lot of disenchanted fliers if they started off with this model. The Scorcher is easy to build—but I'll never claim that it's easy to fly.

Next, I've found from experience, that the advanced modeler *never* follows the plans in detail. With the Scorcher, he may invert the engine for improved cowl appearance, use a different radio receiver, escapement, or actuator, restyle the landing gear attachment, or any one of a lot of changes. So why show a lot of detail? Save it for scale plans.

Finally, I've shown the location of the battery compartment, the radio area, escapement bulkhead, and the center of gravity. There's enough room for most of the small single channel receivers and their battery complement. Each modeler will pack his equipment in—probably with foam plastic—and wire up the components to his own taste and be much happier than if I tried to tell him how to do it.

So let's look at a few of the significant construction points.

Fuselage

The fuselage is a very simple and conventional box, except for the rounding off of the top aft of the wing. The ¼" square stringers give the corner strength even after rounding, as shown in the corner detail.

Cut out the two sides from 3/32" medium sheet, glue the stringers and braces in place, then join the sides together with the bulkhead and braces at the leading and trailing edge. Next, pinch the tail ends together and glue to the tailblock. When dry, add the 1/16" plywood tailpiece which provides the bearing holes for the torque rods.

Pinch the sides together for the slight

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The Scorcher

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slimming at the nose and glue the firewall in place. The downthrust shown gives excellent penetration at high speed, and yields a good sinking type glide with the model fairly flat for good landing characteristics. (One of these days somebody's gonna blast all of the theories on downthrust with some real practical explanations).

Before covering the top and bottom, install your radio gear to be sure of all clearances. Also add the dowels for the wing and landing gear mounting. Now add the sheet balsa to the top and bottom.

The hatch cover is cut from ½" balsa stock and carved to the rounded shape. The slanted surface that fits under the centerpiece on the wing serves a double purpose—it helps hold the hatch in place, (the old reliable rubber band does the rest), and in case of a crash, the wing slides up and over the hatch rather than crushing the leading edge or the hatch—or both.

The hatch is hollowed out enough to fit over the fuel tank, and this is finished except for doping.

Wing

The wing is so conventional no construction details are required. Only a couple of features need to be discussed.

Note the way the leading edge is shaped so the curve is almost symmetrical on the top and bottom. This, together with the slight uptilt on the bottom of the trailing edge, gives a rough semi-symmetrical airfoil, even tho' the bottom surfaces of the ribs are flat. This may seem like a small thing, but two other prototype Scorchers didn't have this feature, and it certainly appeared to make a noticeable difference in speed.

It's easy to incorporate the uptilt on the trailing edge. Just build the whole wing flat on your board, but insert a piece of 1/16" sheet under the back edge of the trailing edge; slip it under just far enough to yield the proper amount of raise.

Leave the center section fairing and the 1/16" sheet covering of the center section until after you've cut the wing in half and glued it back together with the dihedral braces. Then cover the center section with the sheet balsa, shape the wing tips, center section fairing and the leading edge, sand smooth, and you're ready to cover.

Tail Surfaces

No tricks here. Cut out the surfaces, sand smooth and glue in place. One thing—install the hinges *after* doping so they won't stiffen and crack. Note the ⅛" braces at the fin-fuselage joint. Cut the outside corner off before gluing; it's easier than trying to shape the braces after they are in place.

Landing Gear

The standard bent aluminum plate, cut to shape gives a nice appearance. In my own case, I found I'd used too thin gauge so, lazy-like, I added an axle.

Flying

You'll find the first test flights pretty exciting. In fact, I'm a little hesitant to say what is the best procedure.

Usually the best way to start is with low power and build up to full power gradually. However, the Scorcher, even when trimmed out, does not handle too well at low speeds except in the glide. But, if you launch the model with the engine screaming, and your trim is such that it starts a fast turn, you have to be quick on the opposite control or else the "ground comes up too fast".

Anyway, this is the best solution if you have the manpower; first, double check all

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surfaces and eliminate any warps.

Be alert! If the model is trimmed out, it will take off unassisted and go into a fast, penetrating climb. If, however, it starts out all right, then, when airborne, a wing starts to drop, watch out for a turn to develop which can get real vicious; correct with opposite rudder—just enough to get straight flight. Then fly the model in a wide turn, opposite the direction in which it tends to turn, until fuel exhaustion. Then watch the glide. Does the model turn in the glide in the same direction as it did under power? If so, correct the rudder setting about 1/16" in the opposite direction and make another short test flight. Continue adjusting this way until straight flight is achieved.

If the model turns in the opposite direction when gliding than it did under power, a slight change in the thrust line is needed. If the model turns left under power, and right in the glide, shim the motor to yield a small amount of right thrust. Reverse the thrust setting adjustment if the opposite tendency is observed.

If your problem isn't a turn, but either a nose-up or nose-down tendency under power, this can be overcome by dropping or raising the elevator setting as required. In the case of the nose-up tendency, be ready during test flying to turn the Scorcher out of a nose-up attitude so it doesn't get into a longitudinal oscillation. For a nose-down tendency, up elevator can be applied as required and the elevator setting adjusted.

If no runway is available and a hand launch is required, be sure the launch is level, into the wind, and fast enough to put the model in the air at flying speed. Don't throw it sharply though. This disturbs the fuel flow and can cause the engine to starve out. Run with the model and launch in sweeping motion with the arm picking up speed rapidly but smoothly. Try to "place" the model in the air at flying speed. Then be ready for corrective control action just as in a runway takeoff.

In closing, let me remark that I've tried to tell you what to watch out for, and in doing so, perhaps you might wonder if it's worth the trouble. The answer will come to you on the first flight you make after you've got the model properly trimmed. Its smooth, fast flight, quick response, and thrilling maneuverability will give you one of the best and most satisfying modelling experiences you've ever enjoyed. And as it streaks through the air, I can hear you now—"No wonder it's called the Scorcher—it's the hottest!"