

# Miss PARANOIA

An important part of racing is competitive "psych." Miss Paranoia can unnerve the most ruthless competitor, leaving a trail of fear wherever she races. / by John Fotiu

**T**he Miss Paranoia is a highly competitive quarter midget designed for winning contests. To win, the airplane must be fast enough to stay ahead of the pack. Equally important, it must have good slow-speed characteristics for the idle landing requirement. If the airplane stalls or is unstable at slow speed, you may not be

able to race the remaining heats because of landing damage.

Tight turning is also important in cutting off precious seconds. Consequently, the wing is probably the single most important factor in designing a racer. After trying several airfoils in the past two years, I settled on a modified Stafford design, as refined by Bob Jones of the Mentor area. His



basic modification to the Stafford design was to streamline the tip airfoil for less drag. This wing design has a good top end, turns tight and slows to walk-on landings.

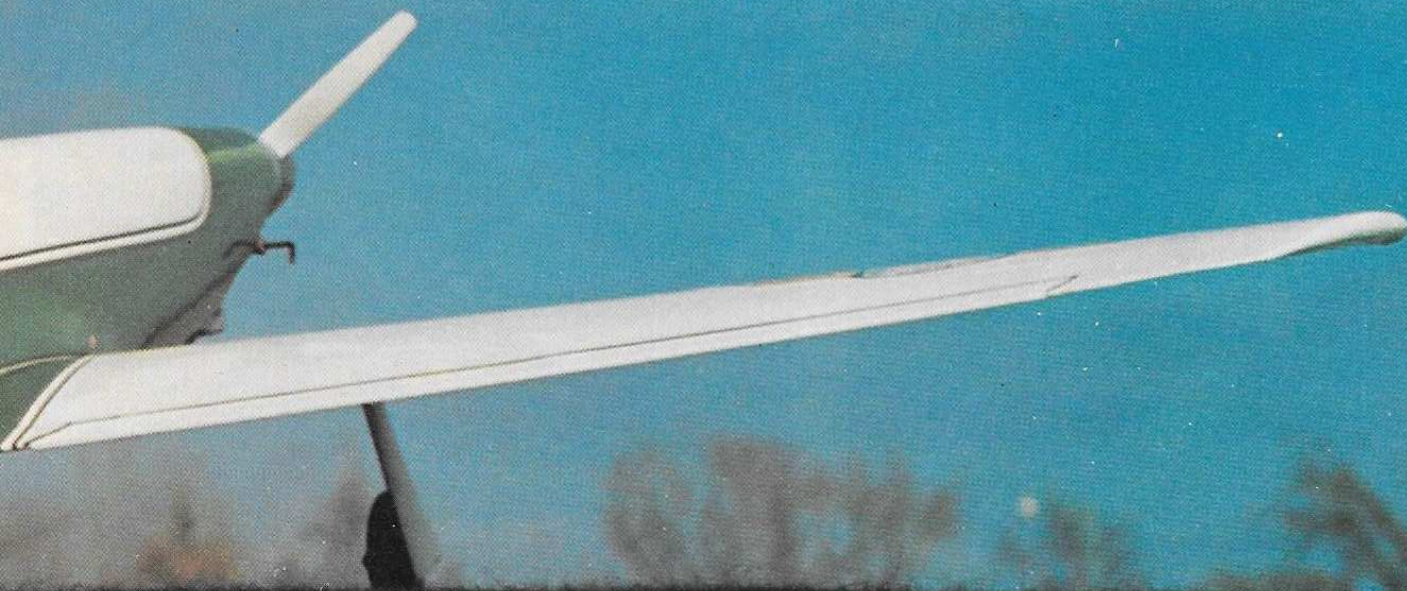
The fuselage and tail assembly are basically just along for the ride, and should be as streamlined as possible. The Miss Paranoia has probably the least frontal area of any

quarter midget yet. This is due to the lack of cowl cheeks, and utilization of the streamlined belly scoop to obtain the five-inch height requirement.

#### CONSTRUCTION

Construction is relatively simple and should present no problems.

*(Continued)*



**Fuselage:** The fiberglass fuselage is hand laid, using 6 oz. cloth and epoxy resin. The use of double layering in areas of high stress and a soda straw ribbing make the fuselage quite strong for its 6½ oz. weight. To purchase a fuselage and belly scoop send a \$20.00 money order to: John Fotiu, 30820 Mayflower, Roseville, Mich. 48066.

Keep in mind that when gluing anything to the fuselage, such as the scoop, firewall, etc., epoxy must be used. Polyester resin will not stick to the fuselage.

**Engine Installation:** The Miss Paranoia front end was originally designed around the O.S. 15 engine. Since the ST, K&B and Taipan engines use a larger mount than the O.S., considerable grinding of the mount will be necessary to fit it into the narrow nose.

The engine may be mounted sideways, upright or inverted, but keep in mind that the tank center line must be even with the center line of the needle valve. Begin the firewall installation by rough-cutting an opening for the engine. Drop in the engine mount, and bolt the engine to the mount. Now make a 1/32" plywood spacer to fit between the fuselage front and the spinner back plate. Bolt the spinner assembly in place, and tape the spinner solidly to the fuselage. Again, this may take a few trial fits because of the grinding necessary to the larger engine mounts.

Cut out the firewall and drop it into position through the wing saddle opening. Trim the edges of the firewall, until



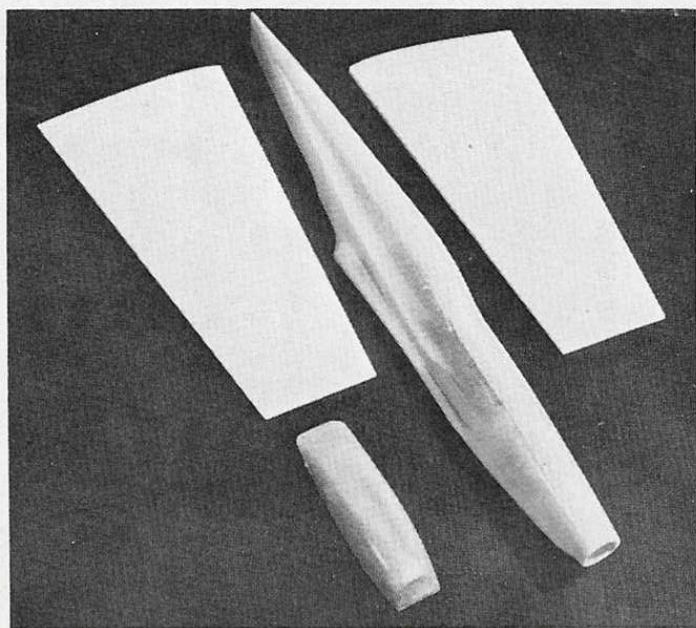
Miss Paranoia was fifth in the Pylon Racer category at Toledo. At the Mentor World Q/M Championships, the design placed second, third, fourth and fifth.

it fits flush against the back of the engine mount. Coat the front of the firewall with a light film of epoxy before gluing it in place.

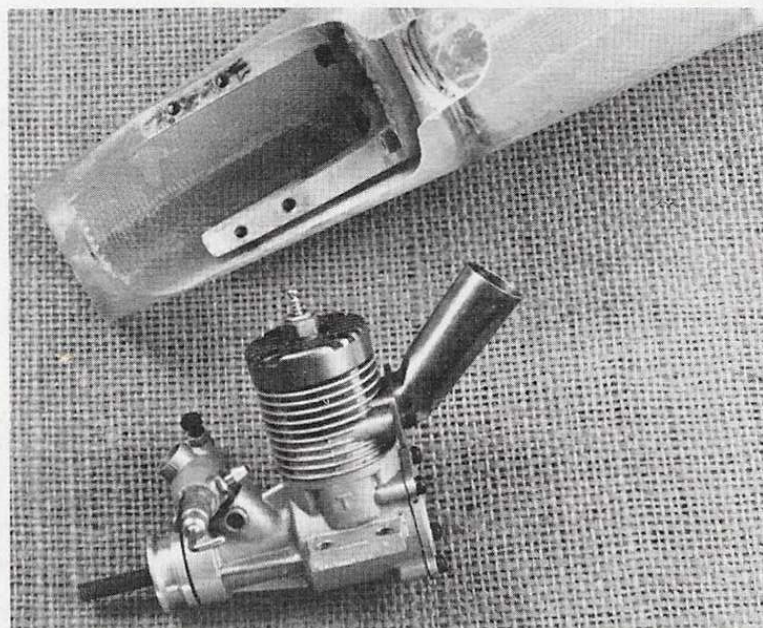
When dry, remove the engine. The engine mount should be lightly epoxied to the firewall. The engine mount holes are now easily drilled in the firewall, after which the 6-32 blind nuts are installed. The firewall may now be permanently bonded in place, using small pieces of epoxy-saturated fiberglass cloth.

When the engine and spinner are properly installed, there should be a 1/32" space between the fuselage and the spinner.

**Wing:** Begin by cutting the root and tip templates from 1/16" plywood. Be sure to cut the cores with the 3/16" washout, as shown on the plans. Make up four wing skins from 1/16" balsa sheeting. The entire wing can be covered with four 1/16 x 4 x 36" sheets, if you lay them out as shown. Using Sig Core Bond or other contact cement, carefully



Buy a fuselage (\$20.00), or a full kit (\$32.00) from the author.



The new Taipan 15, with a homemade exhaust pipe. Note the cutout in the fuselage to clear the pipe.

cover the wing halves in the polystyrene blocks they were cut from. This will insure that the washout will be the same in each wing panel.

Trim the protruding balsa and glue on the leading and trailing edge strips, using Titebond or equivalent. Block sand the 3/8 x 5/16" trailing edge strip to conform with the wing airfoil. This should make it easier to center the 1 x 1/4" trailing edge stock on the wing.

If you choose to use the one aileron setup, tack-glue only the right aileron stock in place. Glue on the wing tip blocks, and sand each wing panel to airfoil shape.

The landing gear blocks are made by laminating 1/8" plywood. Locate their position on the underside of the wing by measuring from the plans. Lay the landing gear blocks on the sheeted wing and trace with a ball-point pen. Remove wing skin and polystyrene foam to a total depth of 1/4". Epoxy the landing gear blocks in place flush with the bottom of the wing.

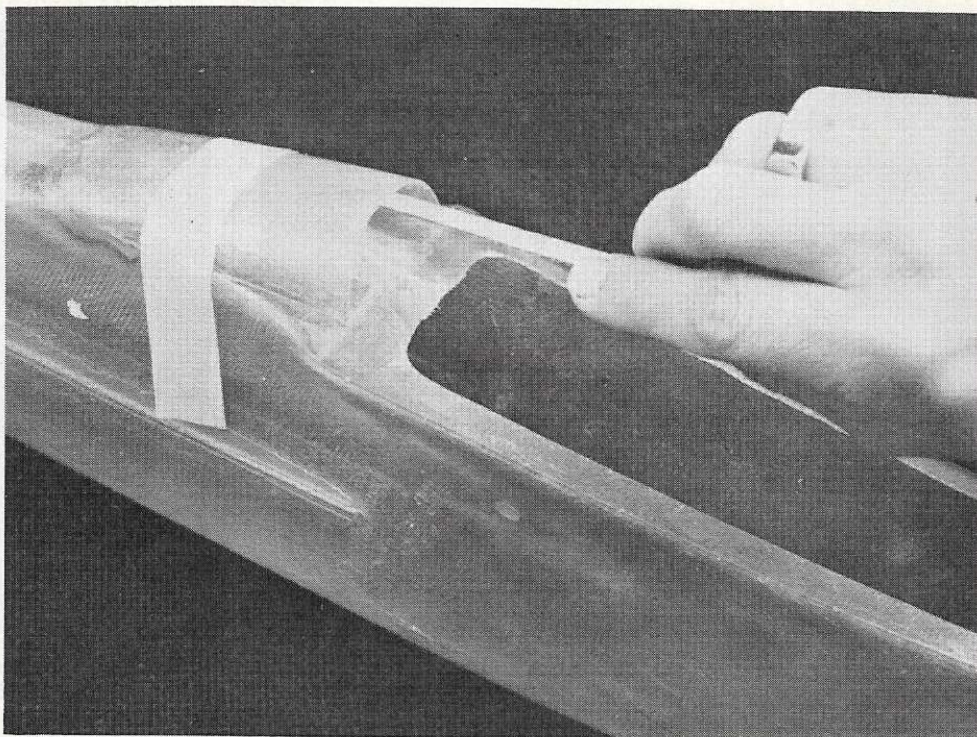
Block sand each wing root to obtain the correct dihedral, and epoxy wing halves together. Add a strip of two inch wide fiberglass tape or Celastic to center section.

Position the 1/8 x 1 x 1 1/2" plywood landing gear support on top of the wing center section. Drill 1/8" diameter holes for the landing gear wire. These should go completely through the wing. The landing gear wire should protrude at least 1/16" above the plywood support. This type of landing gear has proven itself to be very strong and lightweight.

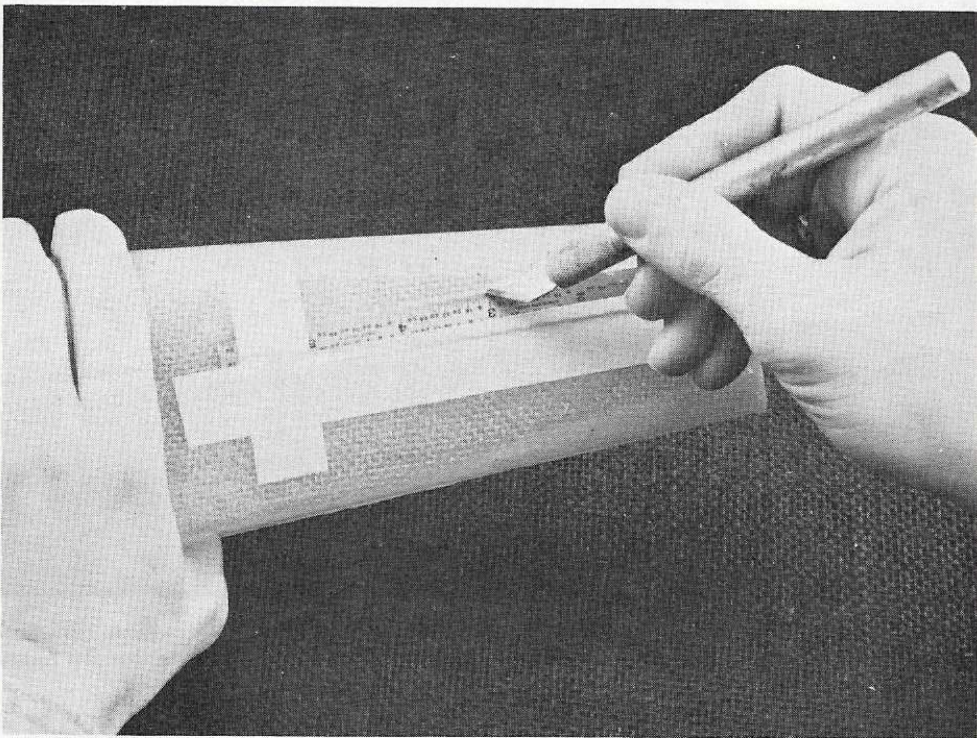
Remove the trailing edge stock and install the aileron torque rod assembly. Also drill the 3/16" diameter holes in the leading edge of the wing for the locating dowels, but do not epoxy in place at this time.

Using the template on the plans, make the 1/8" plywood dowel locator and epoxy in place on the fuselage. Epoxy a block of the motor mount stock to the rear inside lip of the fuselage wing saddle. Also, add the wing saddle tape.

At this point, the wing locating dowels are epoxied in place and, while the epoxy is still tacky, the wing assembly is positioned on the fuselage. When completely cured, the rear wing hold-down hole is drilled and tapped for the 10-32 nylon bolt. Bolt the wing in



Use a stick to spread epoxy inside the rear portion of the air scoop. The horizontal line in the fuse, at the end of the tape, is a soda straw, which is epoxied inside the fuse as a stiffener.



Tape a steel rule to the fuselage, then scrape a slot for the stab with a sharp X-acto.

place, and epoxy the front portion of the belly scoop to the wing. The open ends of the scoop are capped with 3/32" medium balsa. Also, cut an access hole in the scoop for the nylon bolt.

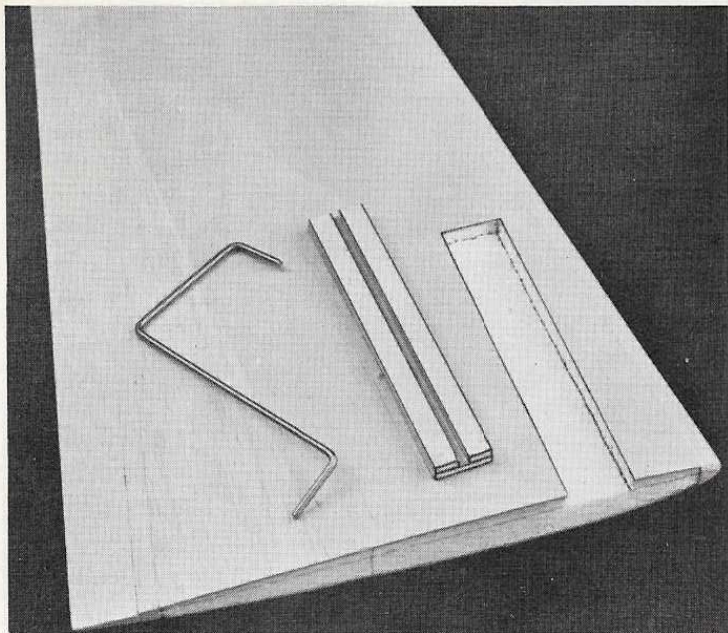
**Tail:** All tail surfaces are cut from 3/16" medium soft balsa. Slot the rear of the fuselage, using a Zona Saw, Dremel tool, or by repeatedly scraping with a sharp X-acto knife.

**Finish:** I used two coats of Super Pox primer, followed by two thin coats of Super Pox color. The wing is

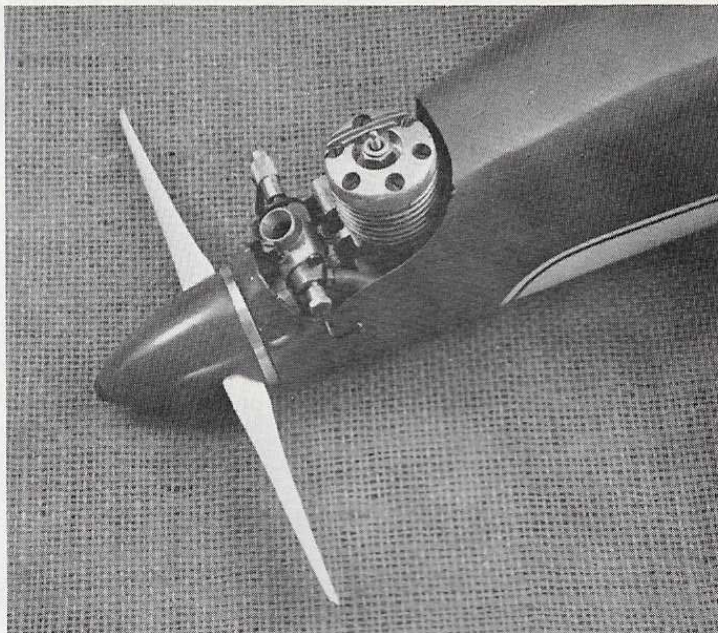
covered with Super MonoKote, with the exception of the center section, which is also Super Pox because of the scoop.

The numbers on the rear of the fuselage are Para-Tipe press-on letters, with clear acrylic sprayed over them for fuel-proofing. You must first lightly sand the Super Pox finish to get the press-on letters to stick. Final trim is black and gold J.D.'s Multi-stripe.

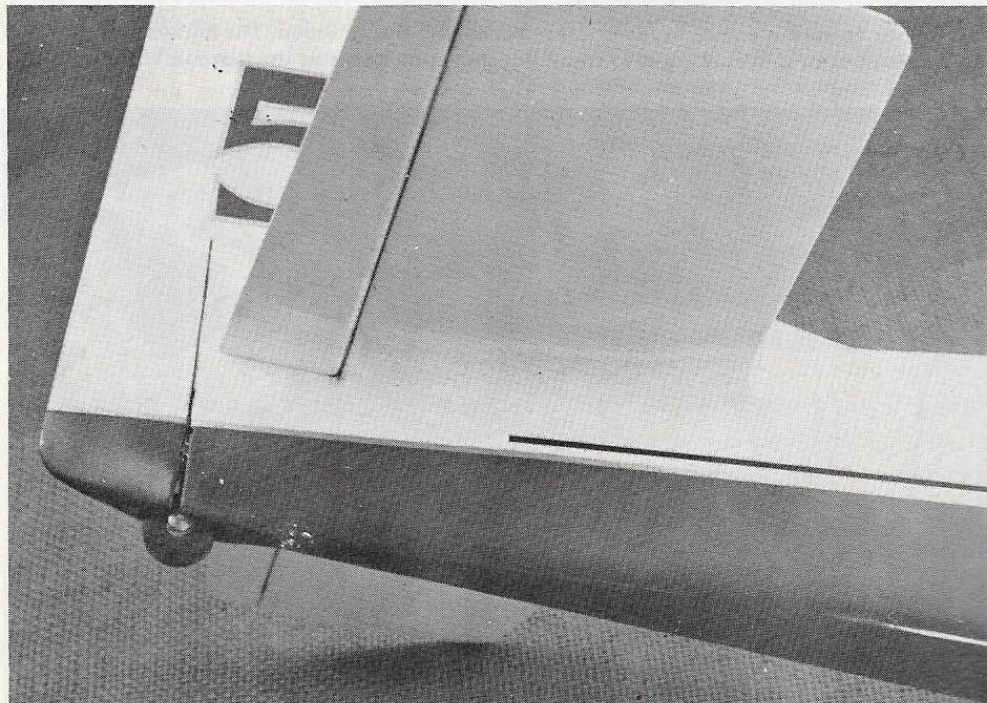
**Radio Installation:** I mounted my servos toward the front of the fuselage to aid in balancing. The servos are



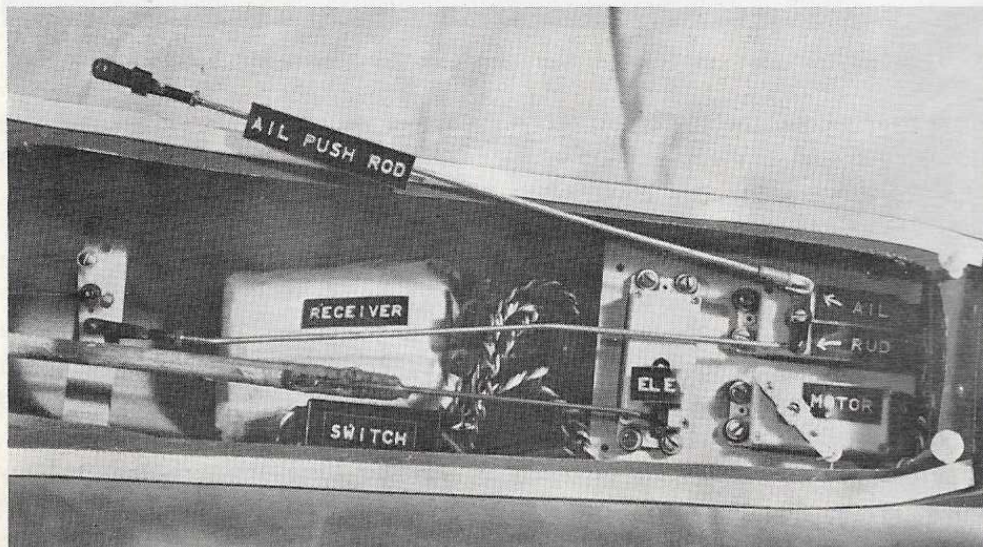
The sheeted wing core with the landing gear trunnion cut out, landing gear block and wire gear.



The author prefers an open engine installation for better cooling and easier maintenance. RPMs courtesy SuperTigre.



ABOVE: A closeup photograph of the tail shows the partial rudder and the recessed tail wheel. BELOW: The radio installation is pushed to the front of the fuselage. Note that the rudder linkage goes through a reduction arm to cut down on throw.



mounted on a removable plywood tray, in order to gain access to the battery pack and tank.

It is advised not to cut out the canopy area of the fuselage. This will allow more room for the receiver.

The rudder servo, which is mounted in the fuselage, also mechanically drives the aileron torque rod, as shown in the photo and plans. The Kwik-Link is simply disconnected when removing the wing. Be sure to use a 2-56 lock nut with the aileron Kwik-Link, so it does not lose trim when disconnected. With the radio installation shown, the airplane will balance out correctly.

#### FLYING

Balance the model on the CG, and set up control surface throws as follows: elevator—1/4" each way; aileron—1/4" each way; rudder—3/8" each way.

If you can fly a low-wing sport or pattern airplane, you should have no problems flying the Miss Paranoia. However, due to its clean design, you have to induce enough drag to slow the airplane down for a safe landing. This is done by holding in about one-fourth of the elevator throw, at a near idle throttle setting, well in advance of the final leg of the landing pattern. Practice slowing the plane down at high altitude to get the feel of it.

There are about 15 active contest fliers racing the Miss Paranoia. I sincerely hope you decide to make it 16.

Gentlemen, start your engines and get ready for another one of those two-minute paranoid acts!