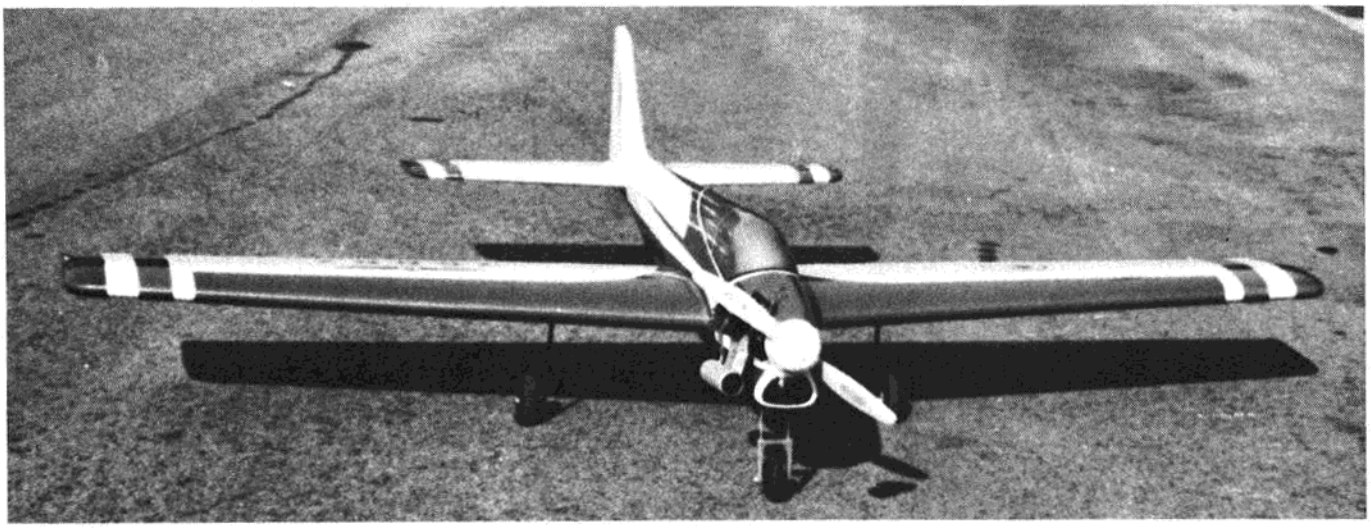
PISCES

Top-notch RC Pattern planes don't have to be complicated to be winners. This is a well-proven flyer and should build up in only several evenings. / by Dave Hale



Pisces was designed specifically for the current AMA-FAI Pattern event. I designed it after flying several popular models and trying to improve them for my own style of flying. This plane is slightly larger than the average pattern ship of recent years with 710-sq. in. wing area and a 54-in. fuselage. This combination produces a smooth flying model which performs the more open style pattern with ease.

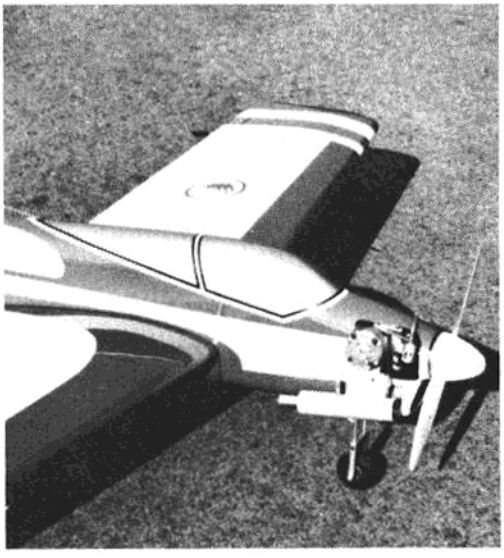
Originally, Pisces was built with a fiberglass fuselage, but without wing or stabilizer saddle cutouts. In this way changes in the wing root percentage, airfoil contour, root length and wing placement could be made. Several of the airplanes have already been constructed, however, all were built according to the plans of the first prototype presented here. The airplane handles and flies so well that no changes from the original design were necessary.

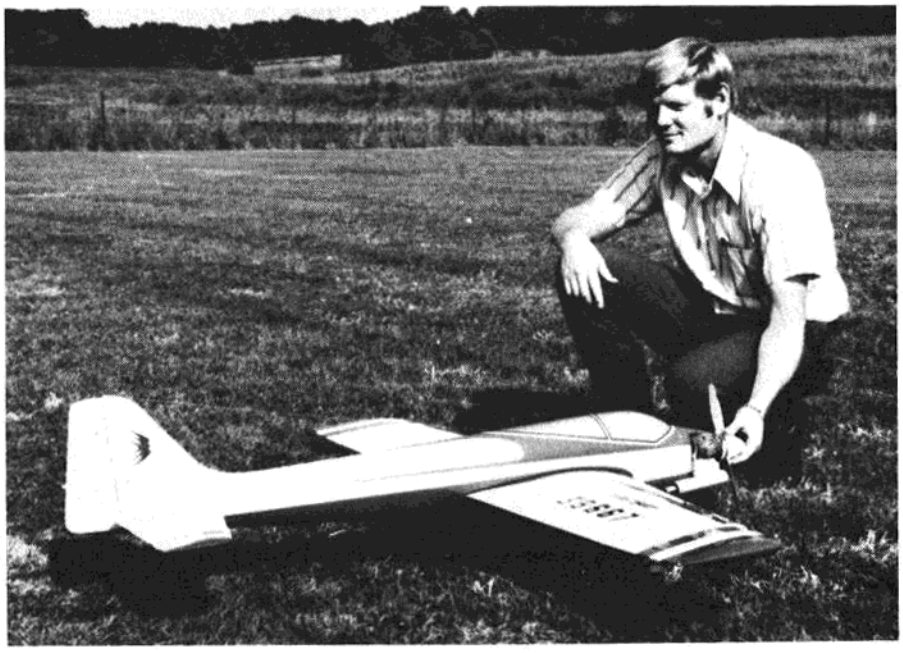
The airfoil is a 15% symmetrical root section with a 15% semi-symmetrical lifting tip section. This slightly lifting tip airfoil helps to avoid wing tip stalls on a straight trailing edge wing and gives the craft a very stable landing attitude at a slow speed. The deep fuselage profile gives good knife-edge flight and rolling maneuvers without weather-vaning on takeoff and landing with a cross wind. The wing is located just below the thrust line and the horizontal stab is on it. This construction allows excellent roll characteristics around the lateral axis. Very little down elevator is required when the model is inverted or in rolls with the force set up as noted above.

I have flown both the smooth contour symmetrical and diamond section horizontal stabilizers, but prefer the diamond section presented here. The thick vertical fin section stabilizes the airplane on the downward portion of the stall turn and figure M with no penalty on any other maneuver. I recommend the use of a good 61 engine and retracting

(Continued on page 87)

Above: Air scoop under the nose is for fairing in the nose-gear retract unit and access to its mounting bolts. Note angled engine position. Right: Neatly painted-in canopy area lends realism to any fuselage. It's an excellent high-visibility paint scheme, too. Power is an HP with a Semco muffler. Below: Author with his extra-light, fixed-gear Pisces. Ample wing area gives it good sport flying ability, and like most models, it flies better with wheels up and at eight lb.





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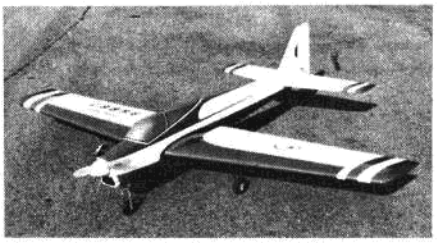

What's in a name? *Pisces*, the fish, is one of the signs of the Zodiac. Check your horoscope before flying this model.

landing gear for the best possible performance. My present model with fixed gear weighs 7¼ lb. A flying weight of 7½-8 lb. with retract gear affords optimum performance.

Pisces won third in the Best Original Design competition at the Toledo Trade Show this year and has done well in other competitions. Since the Pisces is a relatively easy airplane to construct, only the essential construction description is provided.

Construction

Wing: Cut out the wing cores from 3/4 to 1 lb. density foam. Be sure to correctly orient the tip template with the portion marked, "top up," because, as mentioned before, it is semi-symmetrical. Make all servo and gear cutouts before covering the cores with 1/16" sheet balsa.

After sheeting the wing add the tip blocks of soft balsa; hollow and sand to shape. Add the 5/8" thick center section TE from hard stock balsa or soft pine along with the strip aileron control horns. (I make my control horns from Rocket City strip aileron horn sets with swivel and clevis.) Cut the 2-56 rod in half; insert each end into a 1/8" OD x 6" brass tube and solder. A 5/32 x 5¾" brass tube is then slipped over to form a bearing. Finally, the 2-56 rod is bent 90° on the outer end for aileron insertion. The dihedral brace and wing panels are then epoxied together and a three-in. wide strip of glass tape is wrapped around the center section for extra support.

Stabilizer: The stabilizer, like the wing, is constructed of foam core and 1/16" balsa sheet. Note that the sheeting covers both the TE and LE strips. The elevators are carved and sanded to shape from 1/2" sheet.

Fin and Rudder: The fin is quite thick and, therefore, constructed as follows: Cut the leading edge from 3/4" sheet and the rear spar from hard 3/8". Also cut the bottom rib 3/4" wide from 1/4" sheet. Pin down the LE, bottom rib and tip piece. Block up the square 3/8" TE stock to the centerline and glue together. Add the 3/4 x 1/16" sheet ribs. When dry, carve the LE to a 3/8" thick taper at the top and use a large sanding block to sand the ribs flat, to contour. Sheet the sides with 1/16" sheet and radius the LE. Carve and sand the rudder to shape from 1/2" sheet.

Fuselage: Prepare the fuselage sides on a flat building board. Be sure to build two opposite sides, not two identical! Add the top and bottom triangular longerons, wing seat doublers and the TE stock, which goes behind the firewall. When assembling the bulkheads and fuselage sides, use a flat board with a centerline of the fuselage drawn on it to insure a straight fuselage. Use a right angle to true up the sides, and clamps to hold the sides against the formers. When completely dry, add the top and bottom sheeting. The canopy and cowl are carved from blocks which are tack-glued in place, shaped on the outside along with the fuselage to contour and then hollowed. Or, as an alternate method, carve the canopy area and cowl and then use the Hobbypoxy easy-does-it method for making them from epoxy and glass cloth. Add the fin and horizontal stabilizer and final sand the fuselage.

Finishing: Apply two coats of clear dope to the fuselage after final sanding. Cover the complete fuselage with silk and add two more filler coats of clear to harden the surface for durability. Sand the wing and tail sections with 320 sandpaper, then brush on a coat of Francis Products surface sanding resin and let it cure. Sand with 320 again and add another coat of surfacing resin. Final sand with 320 wet or dry paper. Check the model for any nicks or dings and fill them with automotive-type glazing putty and sand out. Next, spray the entire airplane with a fairly heavy coat of automotive lacquer primer and let dry. Sand all of the primer off with 400 wet or dry paper, except what remains in the silk weave and small pits in the surface. I finished my airplane with Ditzler Acrylic Enamel. Use a tac rag to take off all dust, mix and spray the enamel according to the instructions for a sparkling and durable surface finish.

Flying

Check the model for CG balance indicated on plans. I tried offset thrust but found zero-zero-zero on the engine, wing, and horizontal stab alignment to be the best flying trim. The aileron horns are bent forward about 15° for differential. It is a good practice, especially on a long fuselage-type airplane, to keep the pushrods as straight and rigid as possible for minimum flexing.

When airborne, Pisces is easy to fly and fairly fast. It is capable of doing excellent maneuvers, depending only on the proficiency of the flier. When landing, set up a good angle of attack to kill off the forward airspeed and the plane should settle in for neat, main-gear, nose-high landings. Follow the notes above and you should produce an excellent flying competition airplane. If you have any questions, please feel free to write me: David Hale, 1126 Sylvan Dr., Wilmington, Ohio 45177.