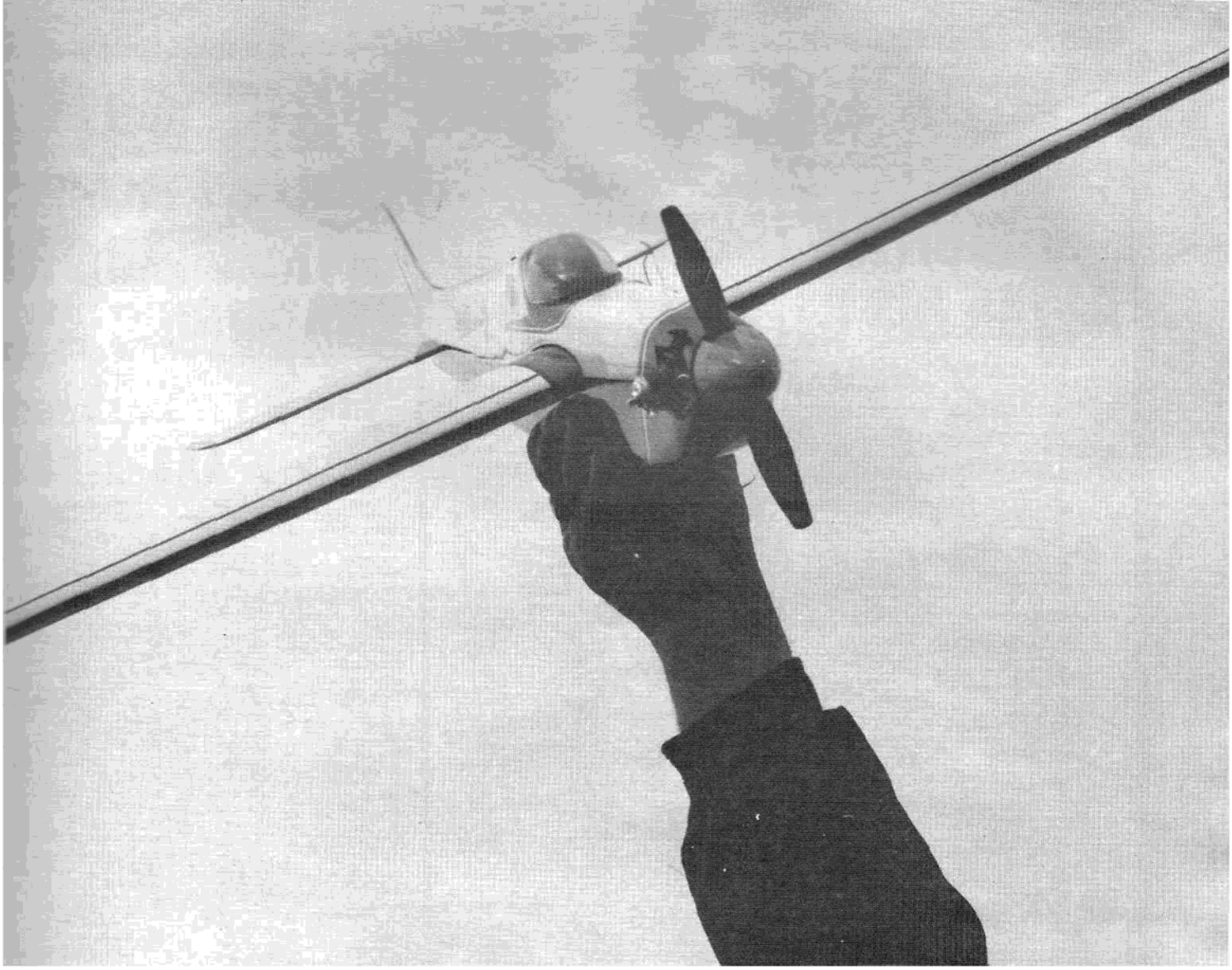

Clean lines are evident in this shot. Eyelash combines the inherent low drag of a mid-wing design with high power output of the TD .049.

EYELASH

By ART SCHROEDER

Tiny R/C Pattern ship powered by the fabulous Cox TD .049 has a great deal to offer Expert and Sport flyer alike. With Eyelash, you will find low cost, easy building, plus explosive Pattern ability.

• In this day of accelerating costs, R/Cers have been looking for ways to reduce their hobby expenditures while still having maximum fun and relaxation. This has led to greater numbers of 15-to 40-size aircraft being flown at sport fields across the country. But why stop there? If material and fuel costs can be lowered by reducing aircraft and engine size, and with fuel prices now up to $8.00 per gal. an .049 powered plane should be ideal.

Simply stated, the .049 engine is great, but it is only useful for putting around the sky with a high wing trainer—right? Well, friend, such a statement couldn't be more wrong—the .049 can handle any maneuver a 60-powered monster can muster and costs 10% or less to run than the big birds. Tom Runge and Owen Kampen clearly demonstrated this when they did early experimental work with the Pacer and Mach None, now kitted by Ace.

These gentlemen proved that, when coupled with the proper airframe and modern sub-miniature radio equipment, the TD .049 is capable of tremendously high performance levels. Eyelash is cut from that bolt of cloth and further proves the original design concepts of Kampen/Runge as essayed last year in *American Modeler* magazine. This time, however, in a true mid-wing design.

Eyelash has proven itself capable of doing most maneuvers that an aileron/elevator equipped airplane can do, and when rudder is thrown in, the entire FAI pattern is possible. Moreover, when wind levels are low and with the right hand on the stick, these maneuvers can be of competition quality. Even with that performance potential the aircraft is very stable and not at all difficult to fly, but it is fast and not recommended for beginners. The construction is deceptively simple, no more than for any small trainer, but this doesn't mean that you end up with trainer performance—it's a handful!

At first glance, Eyelash looks like a shrink job of this author's original Eyeball (M.A.N., August, 1968). Except for the mid-wing configuration we've retained, that is not the case. Proportionally the Eyelash has a longer tail and nose moment, its fuselage is considerably thinned in lateral

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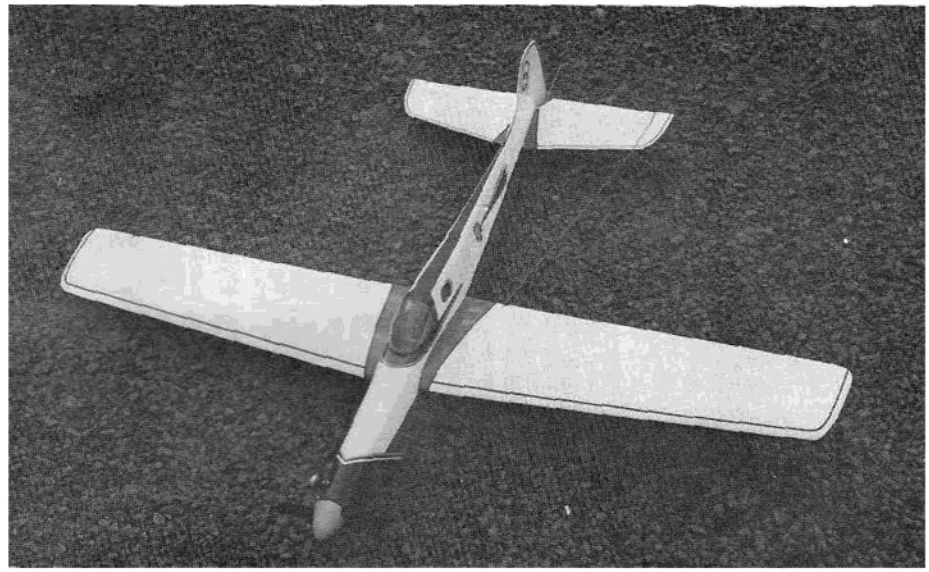
area and its wing is totally different. The little plane is more closely aligned with Migi-Ball, our 40-version Eyeball (M.A.N., August, 1972).

The mid-wing configuration is the lowest drag setup we know of, and the plane flies essentially the same, upright or inverted, which reduces the need for elevator corrections in rolling maneuvers and while inverted. Mid-wing style also makes hand launching simple, since you just grasp it under the wing and toss. With the wing well above ground level, skid landings on grass never damage the soft foam wings.

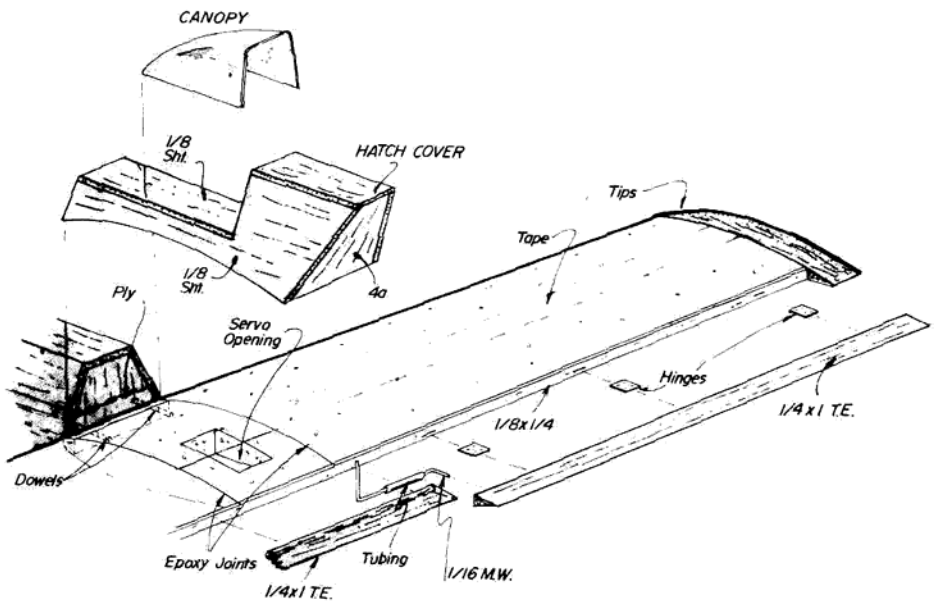
Eyelash's fine flying capability stems directly from Ace's fine foam wing sections. We at first wondered about the semi-symmetrical airfoil, but this has caused no problems, and we now wonder if this kind of airfoil is not superior to the more common, fully symmetrical foils found on Pattern aircraft today.

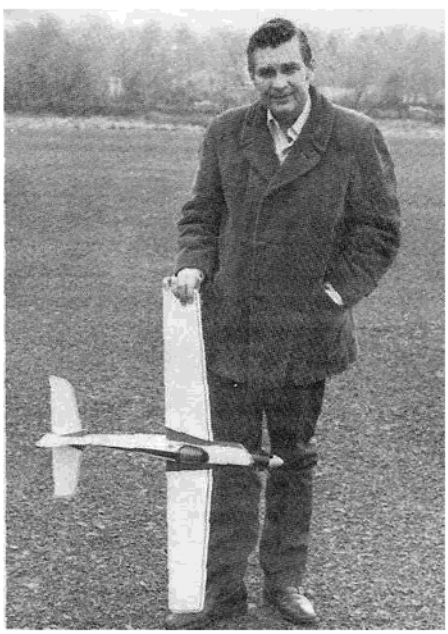
Building Eyelash is simplicity itself. Order a set of Ace's tapered wing sections and one straight wing panel, a couple of sheets of hard 1/8" sheet for fuselage sides and fin, some 3/8" triangular stock, a 3/16" x 3" piece of medium balsa for stabilizer, 1/8" x 1/4" spruce trailing edge stock and some 1" tapered stock for ailerons and elevator. A bit of soft balsa block completes the needed material. We designed, drew lines, cut parts and built the first Eyelash in three evenings, with much of the credit going to the new cyanoacrylate glues (Hot Stuff, Zap) that make joints an instant proposition.

The plans should be self-explanatory for all except the newest R/Cer, and if you're *that* new to the sport, don't tackle Eyelash. To repeat, while this mini-machine is not hard to build or fly, it is *fast!* Unless you have a good solid flying background, you could find yourself in trouble faster than you can bat an eyelash (oops!).



Ship is completely covered with heat shrink plastic materials for light, colorful finish.





Editor's big feet are good for something, including protecting wing tips. RS equipment.

Kit the plane by cutting out all parts prior to any assembly. This speeds things up. At the same time, prepare the foam wing sections according to the plans. What you want is a straight trailing edge with all sweep in the leading edge. Glue the three sections together keeping all taper on the under surface; of course, the top surface will then be flat. For this reason it's easier to join the sections upside down on a flat surface. All foam joints are made with epoxy. Glue on the 1/8" x 1/4" spruce trailing edge and the soft balsa tips and, except for sanding and shaping, this part is done.

Servo hole is cut through and a ply floor added to support the servo; servo tape handles mounting. Use care in setting up the front dowel pins and the rear screw hold-down. Key point here is to get the threaded maple block in the fuselage securely glued in place. It's the one wood joint where we used epoxy.

A few wood construction suggestions are in order. Be sure to fit corner stringers at any point at which the aircraft is to be rounded with sandpaper. Eyelash need not look like a box—smooth flowing lines can result with proper sanding and a bit of filler material. We use acrylic spackling for filler since it is light, sands easily and is easy to apply.

Basic fuselage is built in hand by placing formers 2 and 3 in place, eyeballing it (oops, again!) and then "Hot Stuffing" or "Zapping" the formers in place. Draw the nose together against former 1, check for accuracy and use more instant glue. Draw the tail together—same deal. Then fit the corner stringers in place; 1/8" square every place except the space at the bottom between formers 1 and 2—here, 3/8" triangular stock is used. The wing saddle doubler is set in place, rear top side pieces, front side pieces, stabilizer and fin, top and bottom sheeting. Without exaggeration, the basic fuselage can be built in 15 minutes. The

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canopy/hatch arrangement is as simple to build as can be.

The foam wings must be covered with Solarfilm. Basic reason is, of course, the much lower heat needed for application of this material. Fuselage, tail surfaces and control surfaces can be covered with MonoKote or Solarfilm. Although paint can also be used on wood surfaces (but not on the foam), we haven't seen a decent paint job that can compete with the lightness of the heat shrink materials.

Plans specify a length of 1½" fiberglass packaging tape (three ½"-wide lengths can be substituted) applied full span on top and bottom surface of the wing before covering with Solarfilm. Don't omit the tape; the wing's ability to withstand maneuvers depends on it. It is possible to cut a 3/16" channel top and bottom of the wing to carry 3/16" spruce spars full span. Such spars should be placed above and below the wing's thickest root point.

If spars are used, the wings can be covered with bond paper, applied as balsa wing skins are on larger aircraft. The spar would also be 2 or 3 oz. heavier. If spars are used, the fiberglass tape is not needed. Make no mistake, the tape may not be as nice looking, but it does the job. In a full season of hard flying, our wing has handled everything we could throw at it.

We suggest strips of polyethylene material for hinges. Rudder should be hinged whether you use it as a control or not—it's effective for trimming.

Servos should be mounted with servo tape. Receiver and battery pack should be wrapped with a minimum of ¼" foam.

The skid is not necessary if you fly from grass fields, but should be installed for flights over hard surfaces. The original was only flown from grass, and no damage ever resulted from belly landings. A landing gear in a lightweight block arrangement (similar to typical fixed gear attachment on large Pattern birds) is possible, but this ups weight and cuts performance somewhat. We believe Eyelash will fly well at anything under 26 oz. but the closer to 20 oz., the better.

The original weighed 22 oz. with three servos and a 225 mah battery pack. A two servo setup, aileron and elevator, give plenty of action, but the rudder is well worth the effort since full Pattern capability results. Use straight 1/16" music wire for rudder and elevator push rods. We found no need for internal support on these rods.

When setting aileron throw, avoid more "down" than "up." The plane rolls best when both ailerons displace the same on each side, i.e., equal "up" and "down." If differential is used, make sure it's positive—more "up" than "down." Total throw is about ⅜" to ½". Elevator throw should be about ¼" "up" and slightly more "down"; the airplane is not quite as responsive to "down." Rudder throw should be all you can get. CG position is approximately 2½" from the wing leading edge—some experimentation with this point will trim Eyelash to your taste. CG location is not overly critical, but don't go more than ½" back of the suggested point.

When your plane is finished, set everything at zero - zero. Run your TD .049 on Fox 40-40 fuel; the engine performs well on this fuel. Tank should have a very flexible pickup tube, because over the short distance available in a 1-or 2-oz. tank, movement of the pickup is difficult. The original used a 1-oz. tank, and this was plenty of fuel for 6 to 7 minute flights. A 2-oz. tank can be squeezed in. By the way, pressure is a great idea, but not absolutely necessary. Super performance can be gained by picking up one of Dale Kirn's modified TD .049's or .051's.

When you get Eyelash out to the local field, we guarantee you're in for a treat. Most people who watch the performance of the plane won't believe that you have that small engine for power, it just doesn't seem possible. Their amazement will become your amusement, and it's all going to be at low cost! ■