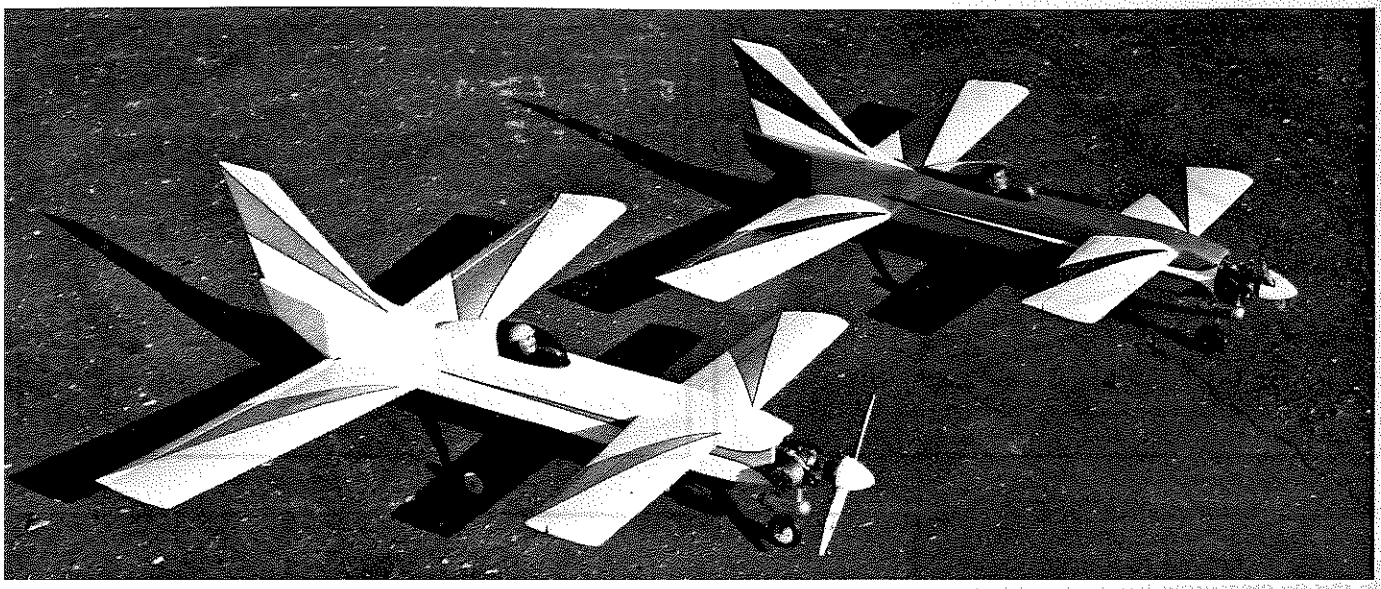
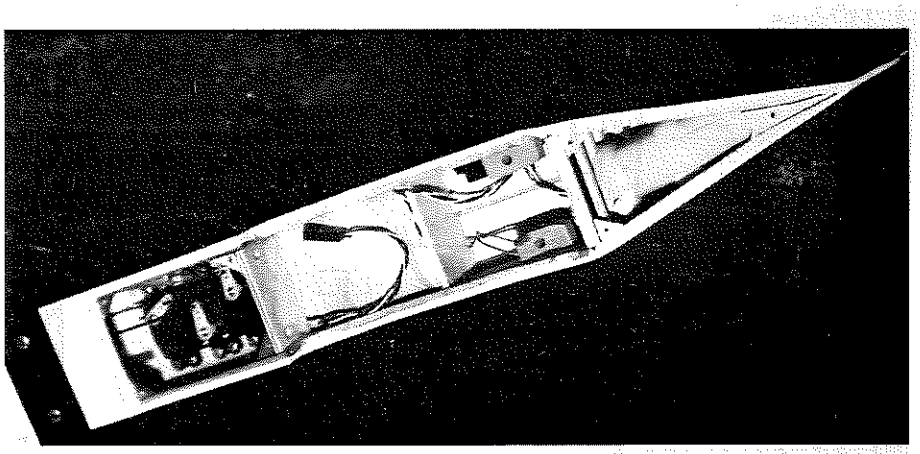


ASCENDER

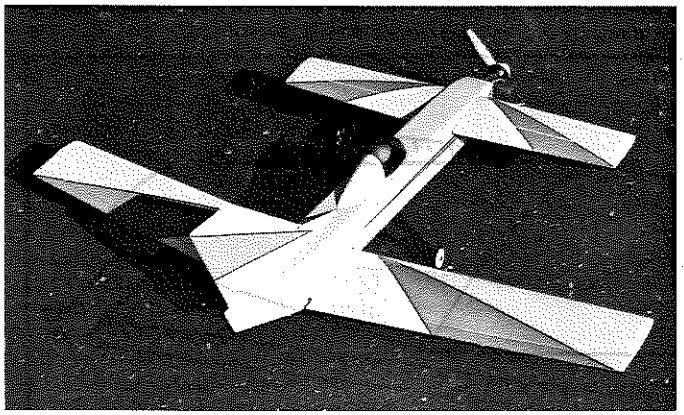
By SKIP RUFF . . . Here's one that will have those "civilian" spectators saying, "Which way do it go, Mister?" Unlike many odd-ball designs, this one doesn't give up exceptional flying ability just to look different.

• My goal in designing the Ascender was to come up with something simple and a bit unconventional. With canards being all the rage these days in the home-built and ultra-light fields, I decided to go with the flow, and the end result is what you see here. It may not be pretty, but it is functional.

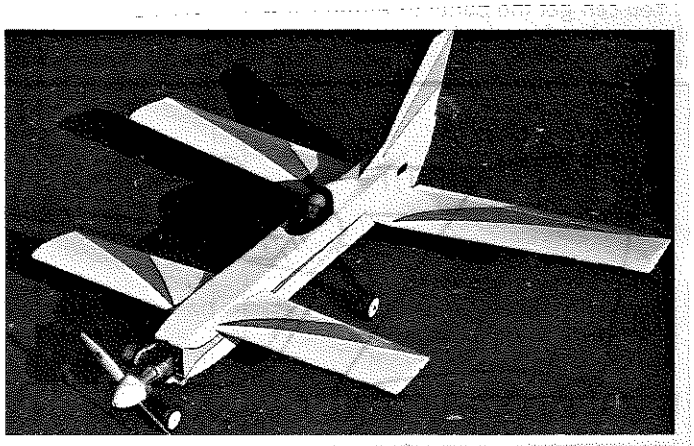
I do not enjoy building wings, so the model was designed around ACE foam wings. The fuselage is more or less a slab sided box with the engine and canard surface (elevator) at the front and the wing and radio at the rear. I did not mount the engine pusher style, as it is on most canards, for two reasons. First of all, I have a natural aversion to using my prize radio as nose ballast. Secondly, I fly off a dirt field, and prop erosion caused by pebbles kicked up by the nose-wheel is pretty bad on a pusher. The only real disadvantage to the tractor design is the gunk coming out of the muffler and splattering all over your nice covering



Radio installation. Use three or four channels. Simplest is 'Y' connector to aileron and nose gear steering servos. Battery pack fits in tail cone section.



Ace foam wing sets make this one a quicker assembly job. Econokote used throughout for lower heat requirement.



Forward engine position keeps grit out of motor, puts receiver safely to rear. Power is .15 to .25. No rudder.

job. Just be sure to take plenty of paper towels and 409 with you to the field.

CONSTRUCTION

First off, you will need three sets of ACE foam wings; two sets of tapered panels for the canard and main wing, and a set of constant-chord panels for the center section of the main wing. Of course, you will have plenty of the constant-chord wing left over so you might want to talk some of your buddies into building one so as not to be wasteful. That is, unless you plan on building seven or eight of them yourself!!

The part numbers and prices of the items you will need to order from ACE are listed below.

TAPERED WING SET . . . #50K101 . . . $3.50 (2 req.)

CONSTANT CHORD SET . . . #50K102. . . $3.50

These are available from:

ACE R/C, Box 511D, Higginsville, MO 64037. Be sure to enclose an extra $1 for postage.

FUSELAGE

Begin by cutting the sides from 1/8 inch med. balsa and gluing the 1/8 x 1/4 longerons, vertical members, doublers D-1 and D-2, and the hardwood wing mount blocks in place. As the nose curves slightly inward at the firewall, it is best to pin the fuselage sides down to a flat board and block up the front about 1/8 inch while gluing in D-1. When dry, the two sides may be joined, using F-1, F-2, and the soft 1/4 square crosspieces. Use plenty of epoxy around F-1. The tapered sides at the rear should be cut off at the break and re-glued back on after beveling the joint.

The canard is constructed by cutting off the inside portion of the tapered panels until they are 12-1/2 inches long each. Epoxy the two halves together, lining up the mold lines on the leading and trailing edges and making sure the *TOP* surface is straight (no dihedral or anhedral). Cut off the elevator section and bevel it as shown to provide clearance when it moves down ('up' position). Cut 2-3/4 inches out of the center of the elevator to make the two halves. Make up the elevator horn from 3/32 music wire and 1/8 aluminum tubing, and epoxy in place on the canard. The model was designed for a .15 to .25 engine so, if using one of the larger sizes, I would recommend a couple of strips of glass tape along the bottom (and top) for strength. The canard may now be epoxied in place on the fuselage.

Now is the time to install the elevator pushrod and necessary linkage hardware, as this area will be inaccessible when the top and bottom sheetings are applied. Leave the pushrod long enough to trim to proper length when installing the servos. The threaded end should be positioned midway in the clevis to allow minor adjustments one way or the other without running out of thread.

The 4 ounce Sullivan tank is next. It must be tilted down slightly at the rear to clear the canard. A length of nyrod (inner or outer) should be installed in which to run the receiver antenna forward through the fuselage, as the receiver is mounted at the rear. I used the small size GOLD-N-ROD for my throttle linkage, so now is the time to install the outer tube. Leave enough at the rear for trimming when the servos are installed. The two pieces of plywood for the landing gear mount are epoxied in next and finally the 3/32 top and bottom sheeting is glued on crossgrain. The 1/8 balsa fin may also be glued on if desired.

WING

The wing utilizes full length tapered panels and a 4 inch piece of the constant-chord section. Using care, and a Dremel jigsaw if possible, cut a slit in each panel for the 1/16" ply spar. The center section is cut in two. Epoxy the center section halves to the spar and, after curing, epoxy the tapered panels to the spar and the center section while blocking up the tips 2 inches. You will have to bevel the outer panels at the joint for a good fit. Use care and lots of eyeballing here to make sure you don't build in any twists. Block sand the trailing edges until they are a 1/4 inch thick, in order to match the aileron stock. Bend the aileron links, as shown on the plans, from 3/32 music wire and 1/8 inch tubing, and epoxy them to the wing. Position the wing on the fuselage, taking measurements fore and aft, and eyeballing it with the canard to make sure it is straight and level. If it doesn't line up with the canard, sand the wing saddle until it does. With the wing secured to the fuselage with rubber bands or tape, insert a 1/8 drill bit through the holes in F-2 with your fingers and drill out the foam wing for the 1/8 dowels. To the bottom of the wing, glue the balsa pieces that fair it in with the fuselage. According to the nylon bolts you are using, drill the appropriate size holes through the wing and into the hardwood blocks inside the fuselage. The wing may now be removed and the 1/8 dowels epoxied in place.

LANDING GEAR

The main gear is a HALLCO unit P/N B105-2, for models 1.7 to 2.7 lbs. in weight. It is attached with wood screws and bent down slightly for more ground clearance. The nose gear is bent from 3/32 music wire and inserted through a hole drilled in the nylon motor mount. When the model is all finished, it should sit with the nose 1/8 to 1/4 inch lower than the tail.

RADIO INSTALLATION

My Futaba radio was installed using S-20 servos and four channels working the throttle, elevator, ailerons, and nosewheel. Rudder control is not needed. A three-channel radio using a Y-harness to hook the aileron and nosewheel servos together could be used or only three servos with a long cable to attach the nosewheel to the aileron servo, although this will make the wing installation a bit tricky. It was used on the first prototype, however. There isn't much excess room to mount a non-miniature radio, so you will probably have to place the components in the location shown on the plans. A 225 mah battery pack is the largest that can be placed in the rear section. Depending upon your choice of engine and radio, you may have to add ballast to the nose or the tail, since they are both so far from the center of gravity.

ENGINE

A .15 to .25 size engine is required. The first prototype flew well with an O.S. .15, although some ballast was needed in the nose. With an O.S. .25 in the second model and an all up weigh, less fuel, of 40 ozs., no weight was required. An 8 x 6 prop is used with the .25, and a 7 x 6 with the .15.

FINISHING

Since the foam surfaces require a low heat film, the entire model was covered with ECONOKOTE. To prevent fuel seep, the firewall, all joints, and all exposed wood and foam areas (especially around the wing saddle) were covered with a thin layer of epoxy overlapping the covering. Once covered, the ailerons and elevator may be attached using your favorite hinge system.

TRIMMING AND FLYING

The center of gravity shown on the plans is with the fuel tank *EMPTY*. Add weight to the nose or tail until yours balances correctly. The neutral position of the elevator is shown in the side view on the plans. Elevator travel is a total of one inch. Aileron travel is a total of a 1/4 inch. Remember that the trailing edge of the elevator moves up for down and vice-versa. On takeoff, hold full up until the model breaks ground. In flight you will find the ship to be fast and groovy, rather like a pattern ship, and thus, not a trainer. Control response is crisp, with the model capable of all aerobatics except for spins, snaps, and knife-edge. Inverted flight, surprisingly, requires little down elevator.

Since the fuel tank is so far ahead of the center of gravity, the model will be somewhat nose-heavy until some of the fuel is burned off. For this reason, if you must land with a full tank, keep your speed up for an adequate flare. That goes double with a full tank and a dead engine, as the elevator loses some of its effectiveness without the prop-wash blowing over it. If you flare too late, or while too slow, you will see what I mean as your model bounces back into the air. As I mentioned earlier, having the model set slightly nose-down on the ground will make landings a bit less dicey.

I do hope you enjoy your Ascender. I've found it to be a cheap and economical change of pace. I would appreciate any photos or comments regarding this model. My address is: Skip Ruff, 128 Lexington St., Taft, CA 93268. If you wish a reply, please include a S.S.A. envelope.

Oh yeah, about the name of the plane, well, don't blame me. It was Bill Northrop's idea! *(That's $1 out of your check . . . for passing the buck! wcn)*