

Unusual from any angle, the Airacuda is bound to get a lot of stares from the crowd. The full-size Airacuda was a popular propaganda weapon in the early days of World War II. It never saw military action, as it turned out. Fourteen were built, but none have survived to the present.

BELL YFM-1 397

Powered by two Cox .049 reed-valve engines, this profile-fuselage Control Line Sport Scale version of a neat plane from the Thirties is easy to build and great fun to fly. It'll be a sensation at the flying field—both from appearance and sound of the twin engines. ■ Dave Haught

THIS AIRPLANE has to rank high among the list of unusual and fantastic designs in aviation history. It is almost immediately recognized as a product of the 1930s, a period of time when all our efforts were striving for the future.

The Airacuda's appearance in its time was, to say the least, shocking. Imagine seeing it parked next to a contemporary biplane fighter of the day, a Curtiss Hawk. The contrast gives one a taste of just how advanced the Airacuda was.

Designed to fend off the threat of enemy bombers making attacks on the American coast, the Airacuda would have filled the role well had it ever been needed. As it was, the Airacuda never fired a weapon in anger. If it had seen combat, it would have been awesome indeed.

An enemy fighter would have little chance of escaping the blast of the Airacuda's twin 37mm cannons and twin 30-caliber guns, all automatically locked onto target. Firepower was of primary concern in its design, and it could deliver it. With a top speed of 270 miles

an hour, the Airacuda would have been a very formidable adversary.

In all, fourteen Airacuda's were built, none of which presently exist. The contributions the design has made to the aviation industry still continue, while the design itself still haunts a few of us.

The Airacuda found a soft spot in my mind. Several odd pictures were all I could find on it for several years. Dozens of letters to different archives turned up little. In September of 1971 a copy of *Airpower* featured the Airacuda story. It was enough to keep me up a few more nights writing for information.

Alas, not a decent three-view drawing could be found. The dreams of a super-Scale Control Line Airacuda would have to wait. But I couldn't. I had to build it. I decided to build it as a profile Sport Scale model to see how it would fly. The results were super! It not only flew well, but it has magic only a twin has. The Airacuda is very maneuverable. It will even loop on one engine.

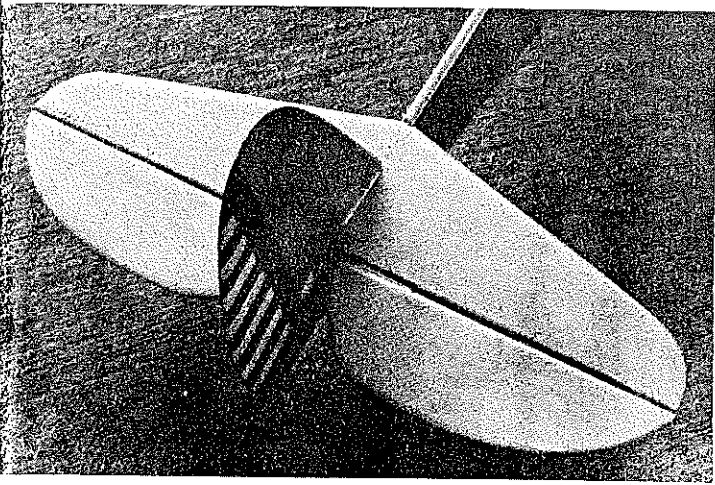
With the distinctive sound of the two engines in harmonious sync and its unusual

platform, the Airacuda gets a lot of attention on the flying field. Few people recognize it by name, but those who read the magazines in the early war years will probably remember it.

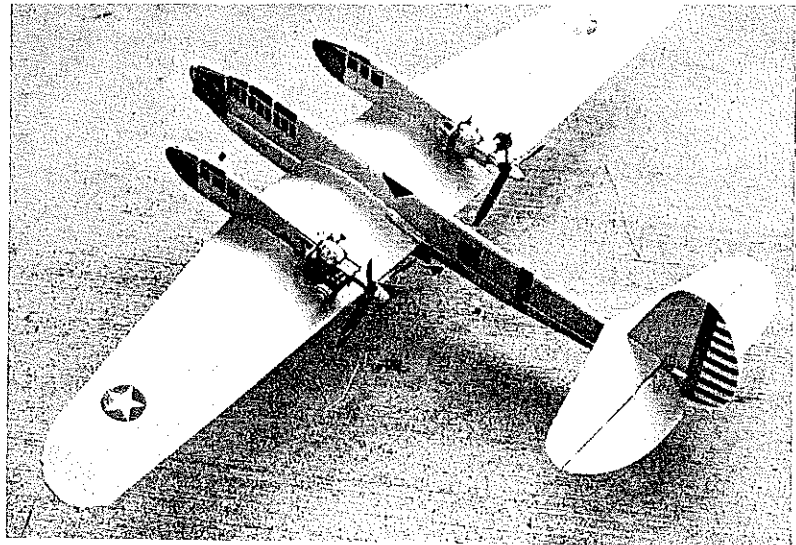
Building the Airacuda should present no special problems. Twins, in general, have a few traits to keep in mind when you build them. With two engines not only does the available power double, but so does the accompanying vibration. It is important that you take care to ensure good, strong glue joints at all locations.

Some of the Airacuda's structure may look too beefy, but it's that way for a reason. Aerodynamic loads are also increased in twins. The original model began to show stress cracks from loops, so I had to plank the wings with 1/32 sheet. As shown on the plans, the construction is quite adequate, yet simple.

The wing is a good place to start building. Cut out all the parts, add the notches to the trailing edge, and begin construction. Pin the



Clean and simple design blesses the Airacuda. Check tail surfaces and hinges regularly, as they get significant stress from prop blast.



Twins rarely offer such good moments and wing area. This one needs lots of nose weight to balance properly with the aft engine location.

leading edge, bottom spar, and trailing edge to the plan, and cut and fit the 1/32 sheet planking between them. Add the ribs, tips, bellcrank mount, metal bellcrank, steel lead-outs, pushrod, and tip weight.

A word here about the control system. You will notice the plans specify a metal bellcrank and lead-outs. The reason is that twins put more stress on the entire control system, and plastic parts generally aren't strong enough to rely on.

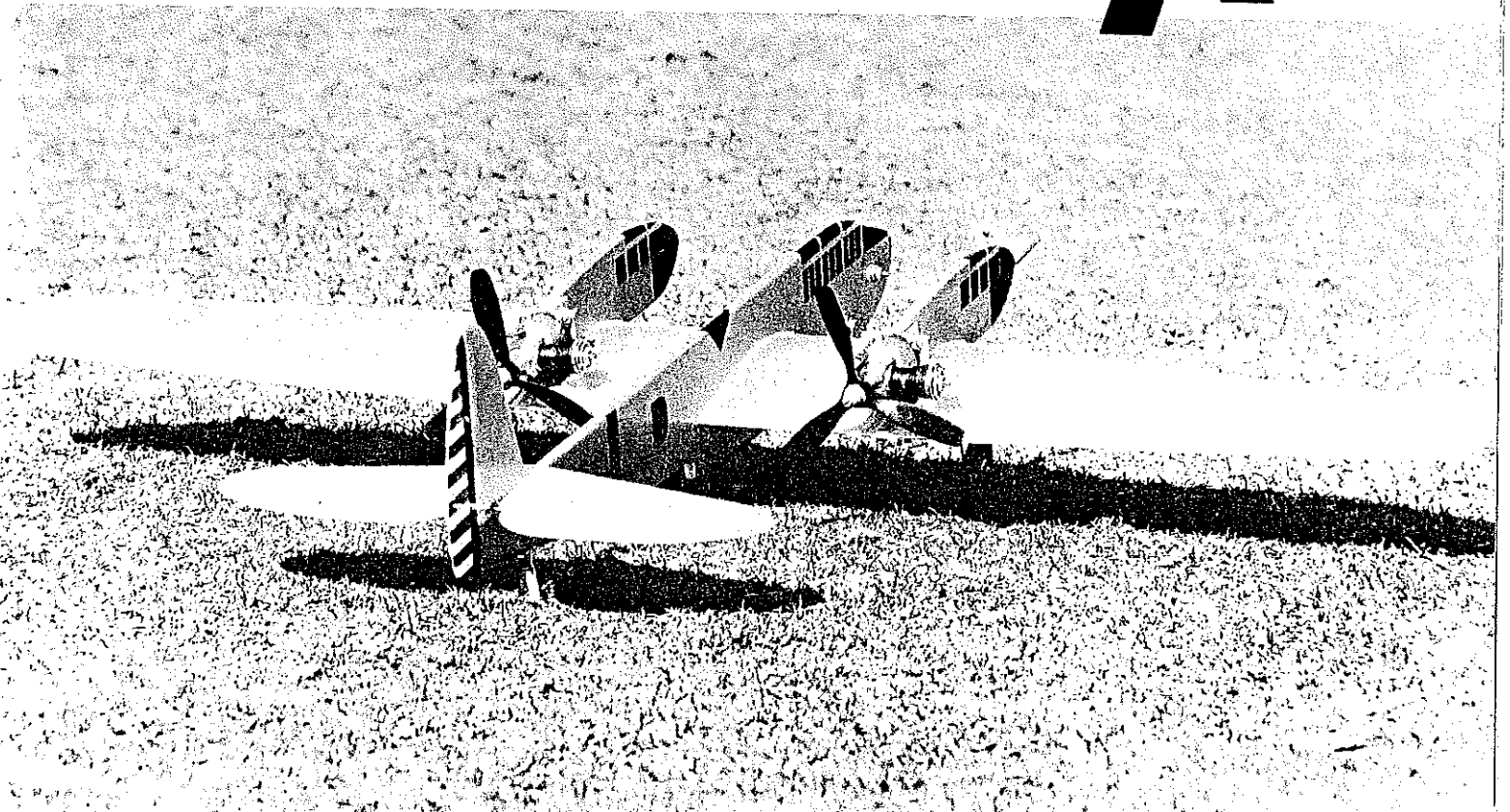
Finish off the wing by adding the top spar and planking. Be sure the spaces for the nacelles and fuselage are square and fit snugly. This will ensure a good fit and alignment at assembly time. When the wing is dry, give it a thorough sanding, and cut the planking out of the notches for the nacelles and fuselage.

The rudder and stabilizer are very conventional. Cut out all of the parts, and

assemble as shown on the plans. The 1/8-in. dowel elevator spar needs to be made from a straight piece to prevent binding. Use strong hinges for the stabilizer, as they have to withstand a fast airflow from the pusher engines. Keep an eye on the hinges for unusual wear, and replace them if necessary.

The rudder offset is important, also. Don't skimp here, as it is the only way of keeping this model out on the lines. Engine thrust adjustments are not suggested to keep line

AIRACUDA



Even at rest, the Airacuda looks fast. With the rudder and stabilizer so close to the pusher engines, the propwash over the tail surfaces makes for good response with just one engine running. With extra vibration (and power) from the engines, use extra care to assure strong glue joints.

tension, as the dynamics involved with pusher engines located so close to the center of lift and gravity make for some complicated problems.

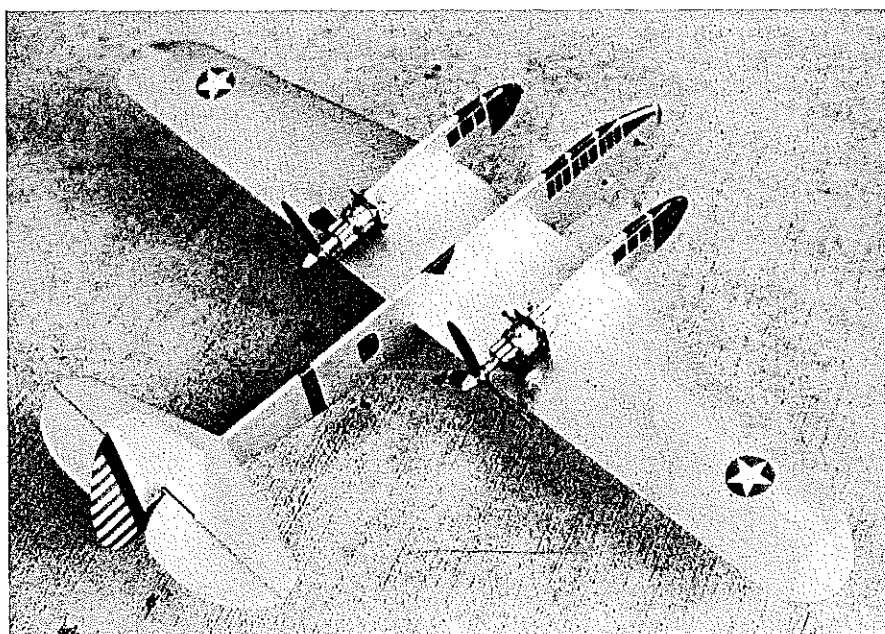
The original model does well with 0-0 thrust and the rudder offset shown. Don't forget to add the notch in the fin for the dowel connecting the elevators.

The fuselage is made from two pieces of sheet. The upper half is notched to fit the leading edge, spars, and trailing edge. Make sure the wing and fuselage line up squarely, then glue the bottom half in place. Use a strong glue, and allow it to set before adding the tail wheel, stabilizer and rudder assemblies.

While that is drying, cut out all the parts for the nacelles. Cut the notches to fit the wing, and glue them together as shown on the plans. Take care to ensure that the firewalls do not have any unwanted offset. Correct any alignment problems, and then wrap the firewall areas with light glass cloth. Glue on the nacelles, and sew the landing gear wires in place. Cover the attachment points with glass cloth, and add the fairings on the bottom of the wing. When all has dried and been sanded, hook up the pushrod and adjust the lead-outs.

Give the entire model a good sanding. Fill in any dents and rough areas. Finish the Airacuda with five coats of clear dope, sanding between each coat. The overall color for the Airacuda is silver. Trim is in red and blue as shown on the plan. While the paint is curing, add the guns, wheels and set up the engines.

The power plants are Cox .049s. They are



Profile Scale is becoming a popular competition event—low in expenditure of time and money, high in fun. The Airacuda is a good way to get started—and into twins at the same time.

easy starting, a prime concern for a twin. The version with the larger tanks will give you a longer flight, but either will work well.

Whichever of the Cox engines you choose to use, they will need to be modified as follows. Remove the backplate to the engines and move the fuel line pickup tube to the front of the tank. Remember that the engines will be facing the rear of the model, so the fuel pickup tubes need to be set to the outside corner of the tank. Set both engines the same, so they each will draw fuel the same way. Reinstall the tanks, and tighten the screws so

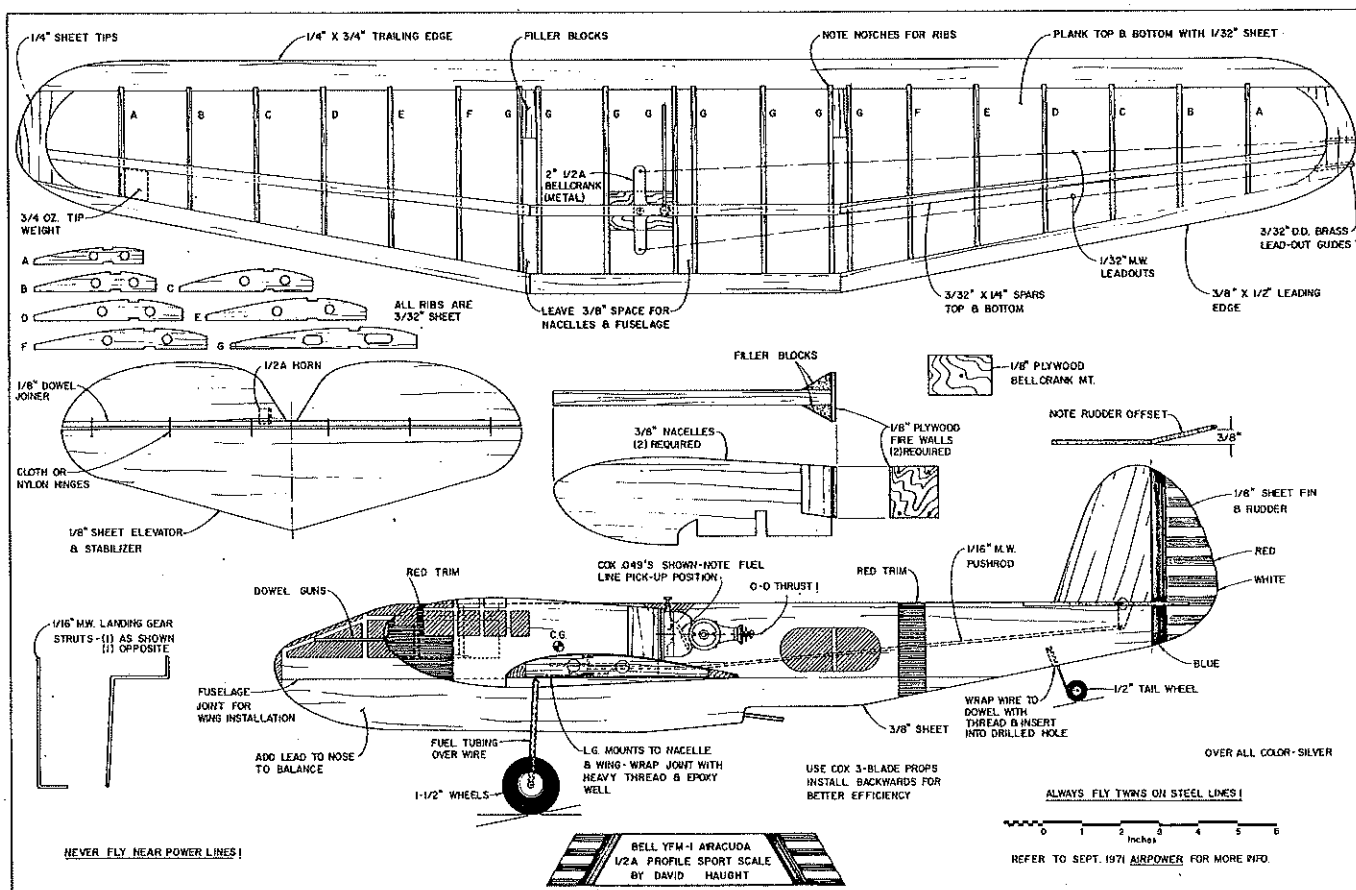
they won't leak. Mount the engines, checking them for 0-0 thrust.

Balance the Airacuda as shown on the plan. The Airacuda is a very responsive model, and it tends to be overly sensitive if not balanced as shown. Don't be worried about the amount of weight it takes to balance the plane, as the added power and large wing area of the Airacuda will easily carry the weight.

Before heading out to the flying field, a few

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FULL-SIZE PLANS AVAILABLE... SEE PAGE 164



Designed by *Lou Andrews*

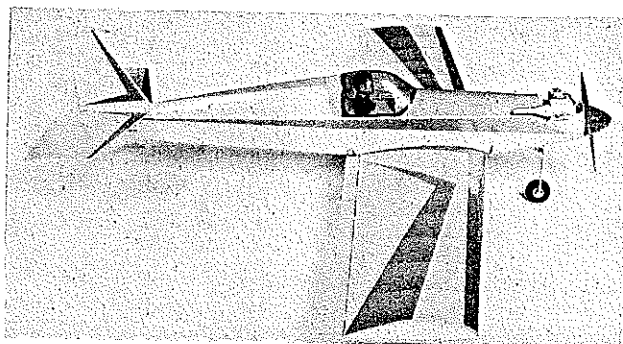
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mousetrap arrangement, but there is no rotating disk to suffer malfunction. The mounting plate is 2.6 x 0.7 in.; depth is 0.55 in.; weight, 17.5 grams plus another 17 grams for the rechargeable battery (lasts 800 to 1,000 actuations between charges). A charger, selling for \$20 to \$25 will soon be available. If AC is not available, charging can be done with a 9V transistor radio battery.

The timing cycle is actuated by a switch connected to the timer by a 6-in. electric wire. Pressing the switch resets the timer to zero; releasing it starts the timing action. This allows the switch to be placed ahead of a swinging-type towhook. When there is a forward pull on the towhook, the timer resets to zero, and when the towline is released—or the towline breaks without releasing—the timing function is actuated. (Now, why hasn't someone already done that with a mechanical timer?)

Order the unit from Koster Digital Timers, PO Box 54, DK-3400 Hillerod, Denmark.

First Intergalactic Ornithopter Postal. Flappers, get your acts together by December 1, 1983! It is a "postal;" you make your flights at any contest or records trial sanctioned by the FAI or any of its affiliates (such as the AMA), and you mail in your scores.

The rules (unfortunately?) are not those for ornithopters flown in AMA competition; that might cause some problems, but we'll cope. The rules are as follows:

Event definition: An ornithopter is a freely-flying model aircraft which derives its lift and propulsion primarily from flapping its wings. (The event director made it clear that no flapping-prop models would be permitted.)

The total supporting surface must not exceed 1,000 sq. dm (That's 15,500 sq. in., kid. No problem, eh?) The supporting surface includes all surfaces used to obtain lift or pitch control. Areas are measured by traces around surfaces. The sum of the areas of any fixed supporting surfaces must not exceed one-half the area of the flapping surfaces. The model must be powered by strands of extensible rubber only. There is no restriction on the weight of the model or on the weight of the rubber used.

There is a sneaker in there that would rule out some models that meet AMA rules, and some models that would *not* meet AMA rules could enter this one. Too bad, I think; one set of rules is about enough!

For more information on the nitty-gritty contact David W. Erbach, 1738 St. Mary's Road #702, Winnipeg, Manitoba R2N 1G8, Canada.

Bob Meuser, 4200 Gregory St., Oakland, CA 95619.

Airacuda/Haught

Continued from page 72

things need to be said about safety. Never try to fly twins on Dacron lines. Always use steel lines. I suggest .007 steel lines 35 feet long. These will give a performance boost and will be safer in the long run, as they do not fray and tangle as easily as Dacron.

Twins are fun to fly, but one needs to keep an eye on that other engine during starting and tuning. Prop "bites" are nasty, and are to be avoided.

The pusher configuration adds a further

complication. The person starting the engines positions himself behind the model, and the helper holds it from the front. It works best if the helper holds the model and the starting battery. Fill both fuel tanks first, then start the inboard engine. Move the battery to the outboard engine; start it, and then carefully top off both fuel tanks, and take off.

One must caution both the starter and the assistant not to reach over the propeller arcs. Fine-tune the engines until they are in sync. There is an unmistakable harmony when the two engines are running in time. This not only sounds neat, but it also reduces the damage from vibration.

One other thing you need to check before launching is that both engines are running in the same direction. The Cox .049s work well in pusher configurations, because they will run backwards without alteration. The

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15%	16.00	10.10	9.25	9.00	258.00	425.00
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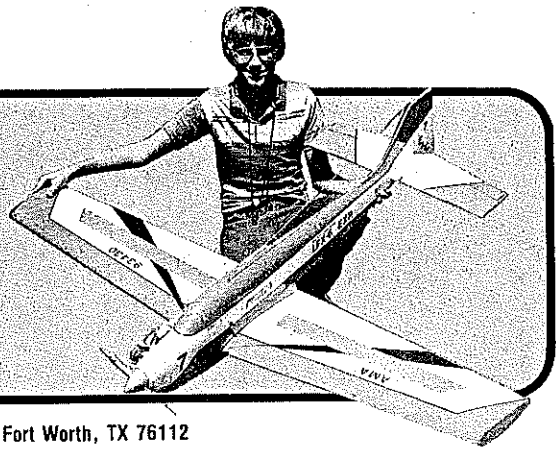
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model will not fly or even taxi if the engines are not running in the same direction, which is not only embarrassing, but also dangerous. One always needs to be safety-conscious when flying, and when flying twins one needs to be even more cautious. This is not to say twins are not fun. They are very exciting to fly.

Profile models are a fun way to break into twins and Scale. In many areas of the country, clubs are adding Profile Scale to the list of their events for contests. It's an excellent way to get beginners into Scale competition at a low cost and high degree of fun. Twins are a way to add to that fun. Try the Airacuda and get ready to answer a lot of questions. If anyone out there ever comes across a set of three-view drawings, I've got a pair of K&B .40s awaiting a large Airacuda home.

Foam Zanonias/McIlraith

Continued from page 62

cold weather, Scott soon developed a whole bag of parlor tricks with our fleet of "seeds." Here are some tricks to try after your

Zanonias are built and adjusted.

Simple Loops: Launch sharply forward and down for two or even three consecutive loops.

Circle and Catch: Bank right or left and toss slightly upward. Adjust the angle of launch so your ship circles and returns to your hand consistently. Then try for two complete circles.

Elvis Loops: Hold your Zanonias upside down, and thrust it straight forward. With practice, it will make a diving loop between your legs, zoom up behind you, and recover above your head.

Take-offs: Place your glider on a smooth floor and kneel down beside it. Rest your fingertips on top of the wing and whip it quickly forward for a looping takeoff.

Formation Flying: When you have these stunts perfected, try this. Stack two or more gliders top-to-bottom or bottom-to-bottom, and launch them all at once. Very pretty formation maneuvers and starbursts are possible with up to four ships that are well matched and adjusted.

Working with foam. At the supermarket,

look for fine-grained foam plastic trays that are used for packaging meat and pastry. They are smooth, feather-light, and about 5/32 in. thick. You will need one that is about 9 or 10 in. long.

This foam cuts and sandpapers very easily. Cut it with any modeling tool, and sandpaper with medium or fine sandpaper glued to a block.

Model airplane glue and dope will dissolve plastic. Always use epoxy or white glue.

Decorate with decals, felt-tip or ball-point pens, plastic model enamel, or almost anything except dope. If ink or paint doesn't stick evenly, sand the plastic lightly to remove the surface gloss.

Building notes. Simple instructions are given on the plan. Building is easy, but exact balancing is important.

When your glider is complete, push a pin through the *Balance Point* and hold the pin horizontally, letting the model rotate freely on the pin like a propeller. One wing will be heavier and will swing to the bottom, but don't worry about that. If the model hangs with the wing straight up and down, or if the nose tilts very slightly down, that's fine. But if the nose points up, add a little clay, a pin, or any handy weight to the nose until the wing hangs vertically.

Now bend the shaded part of the wing tips up about a quarter of an inch in a gentle curve. Don't make a sharp crease, as that will crush and weaken the plastic.

Flying. Try a few gentle glides. If your Zanonias dives quickly to the floor, bend the rear edge of the tips up a little more. If it swoops upward, stalls, and then dives, lower them a bit.

If the ship sort of wallows around, up and down or side to side, add a touch more weight to the nose. Once the balance is exactly right, adjustment isn't touchy.

Bending one trailing edge up more than the other will cause (or correct) a turn. Bend the tip up more on the side that you want the model to turn toward.

You'll find that stunts are easier with the "tail" bent up a little more than for plain gliding.

A little practice will quickly develop the knack for launching and adjusting. If you just

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