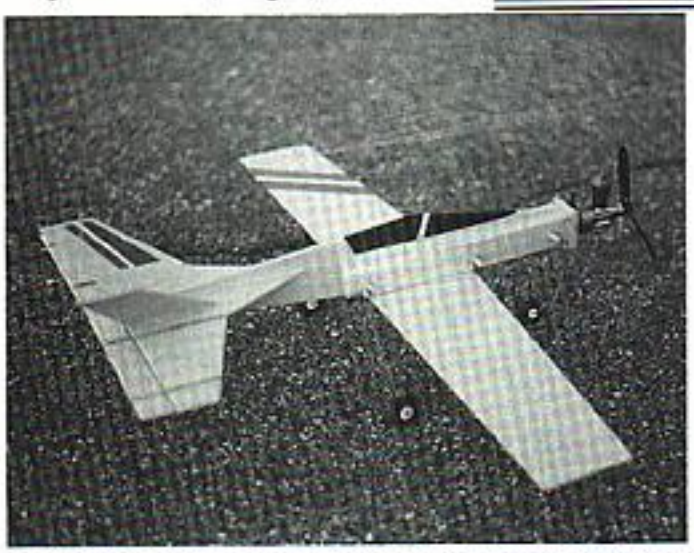
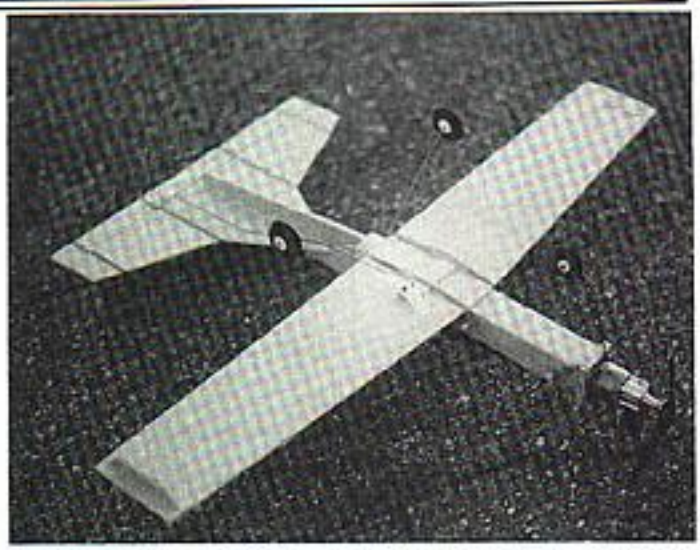
Know a Junior pilot who wants something to replace a worn out plastic Control Line model? This model gladly takes up the lines and does it with a flair and style that's sure to catch a young aviator's eye. ■Allen Wulf

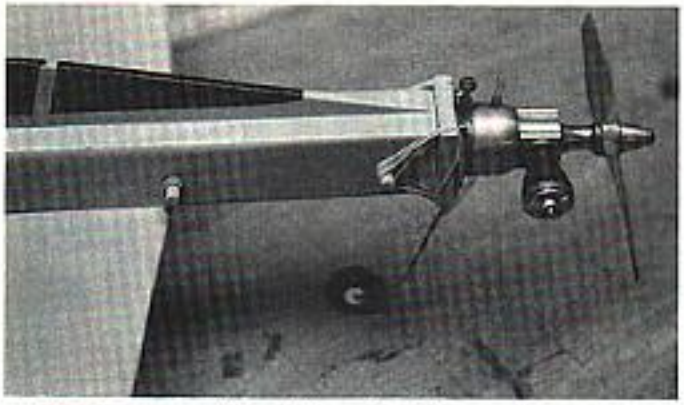
TOP FUN

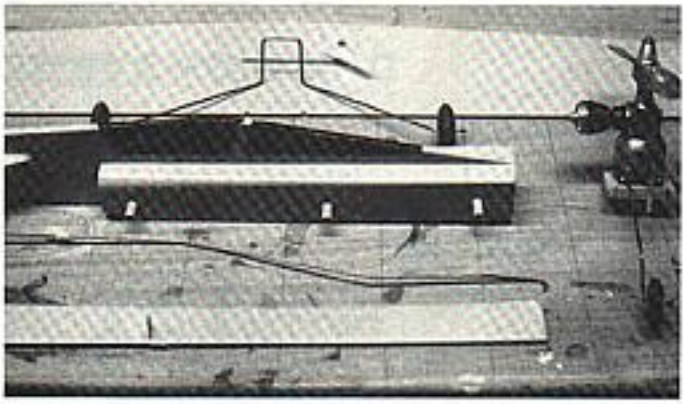
LISTEN UP, MEN, now that you've finished your training on the plastic prop jobs, it's time to taste the real thing. If becoming an adept Control Line flier is your aim, Top-Fun will help you learn the necessary skills. So get out the balsa, the glue, and some el-



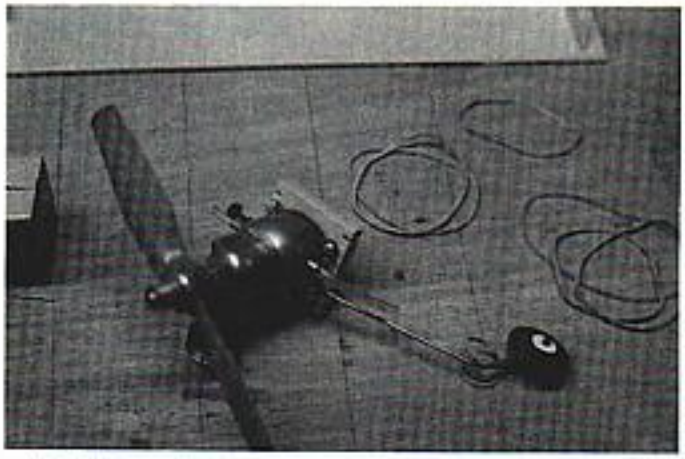


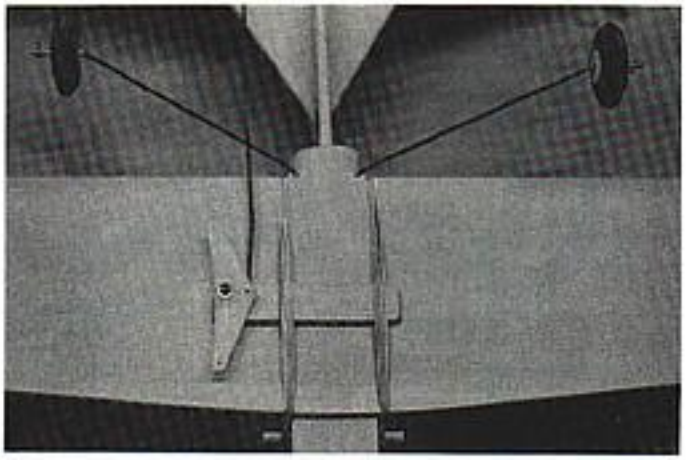
Top: Drawing from the design features of full-size fighting jets, the Top Fun catches the 1980s look for speed and sophistication, yet it is simple to build and fly. Above Left: The tricycle landing gear helps keep the prop out of the dirt on those baseball diamond flying sites and makes the sudden landings look smooth. Above Right: The underside reveals a few of the model's success secrets. Virtually everything that can get broken is held on by rubberbands. A hard impact will cause what looks like a disaster, but a few rubberbands later you should be back in the air.



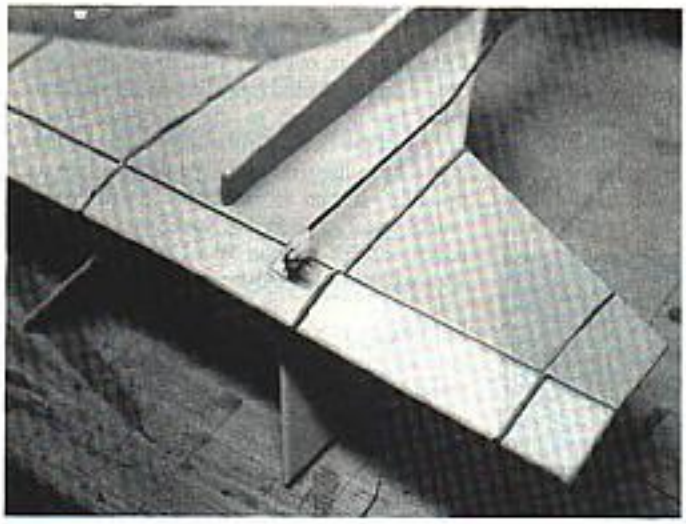


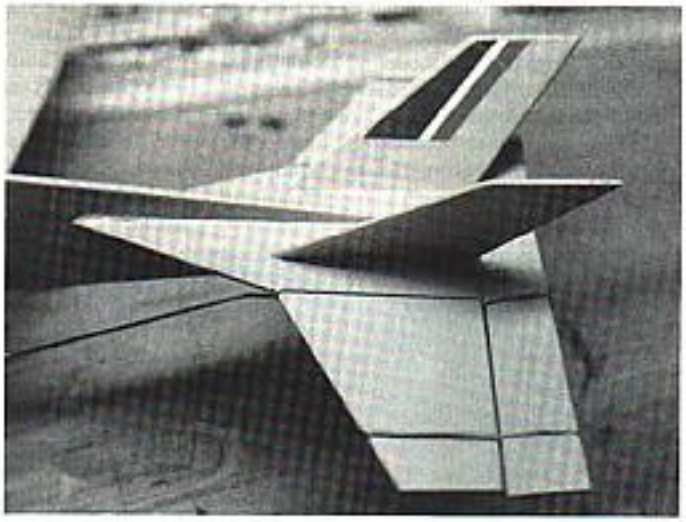
Left: The nose cheeks look like engine fairings and also serve as fuselage reinforcements. Little on this model is vulnerable to sudden stops. Right: Disassembled, the Top Fun looks like a prefab plastic trainer. The idea is to make this model as able to survive a crash as possible.





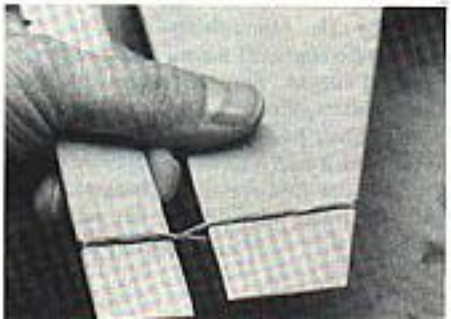
Left: The Cox .049 tank-mount engine screws to the plywood firewall with the nose gear wire sandwiched in between the two. The notches in the firewall are needed to give the rubberbands something extra to hold onto. Right: The bellcrank is mounted to a rather long plywood plate that also adds strength to the wing's center section. The main landing gear is clamped into place between the fuselage and the wing.





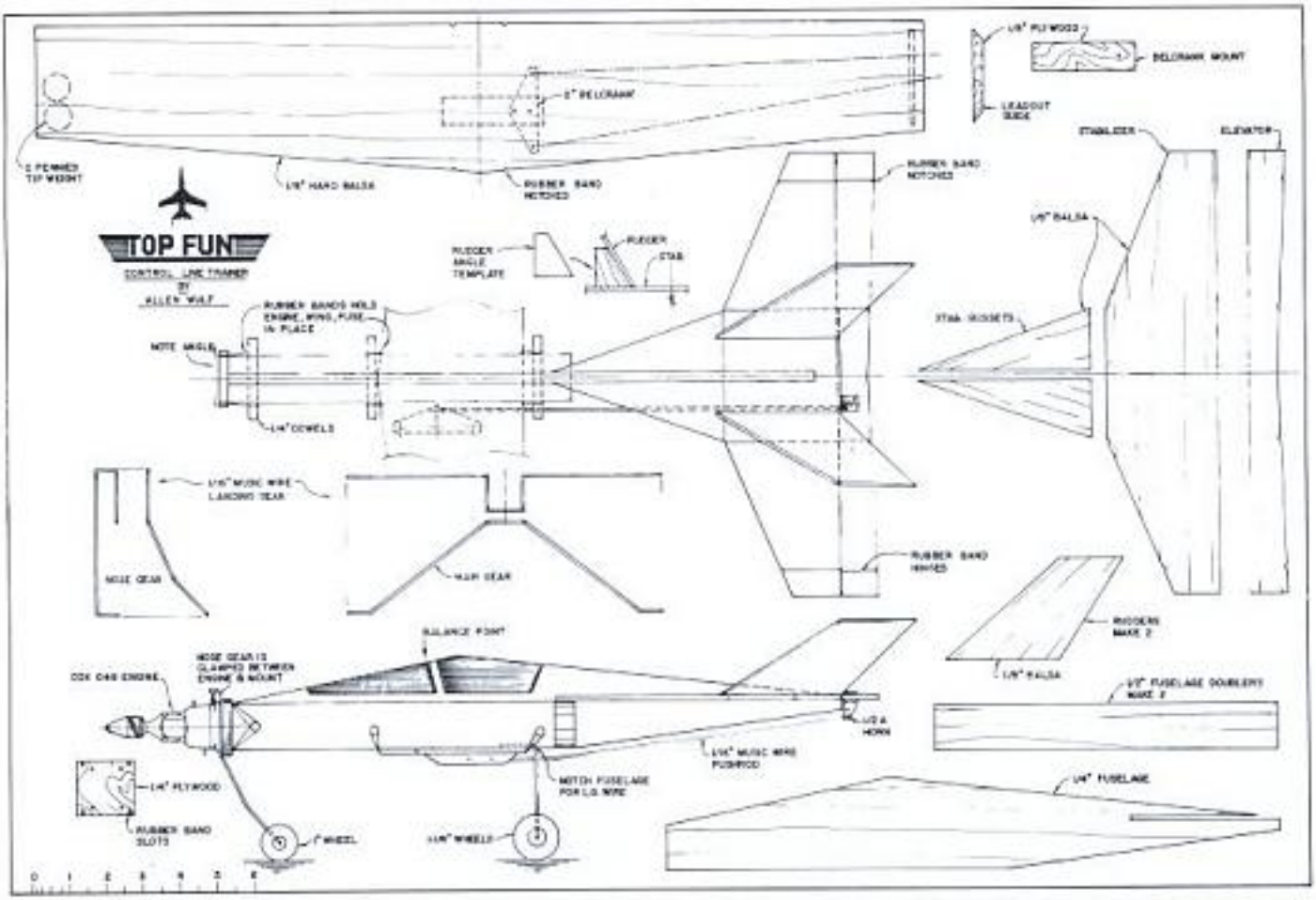
Left: The underside of the tail shows the elevator horn and pushrod hookup as well as angle of the twin rudders. Right: The top view of the tail shows off the unique rubberband hinges used in this model. They are very free moving and can absorb a terrific amount of crash abuse.

Note the twist in the rubberbands between the stab and elevator. The notches in the leading and trailing edges secure the bands.



The outboard wing tip is weighted with two pennies on the bottom to counterbalance the weight and drag caused by the flying lines. Make sure they are glued on securely.

The plywood lead-out guide is glued to the bottom of the left wing panel. Its additional width also helps to strengthen the wing tip.

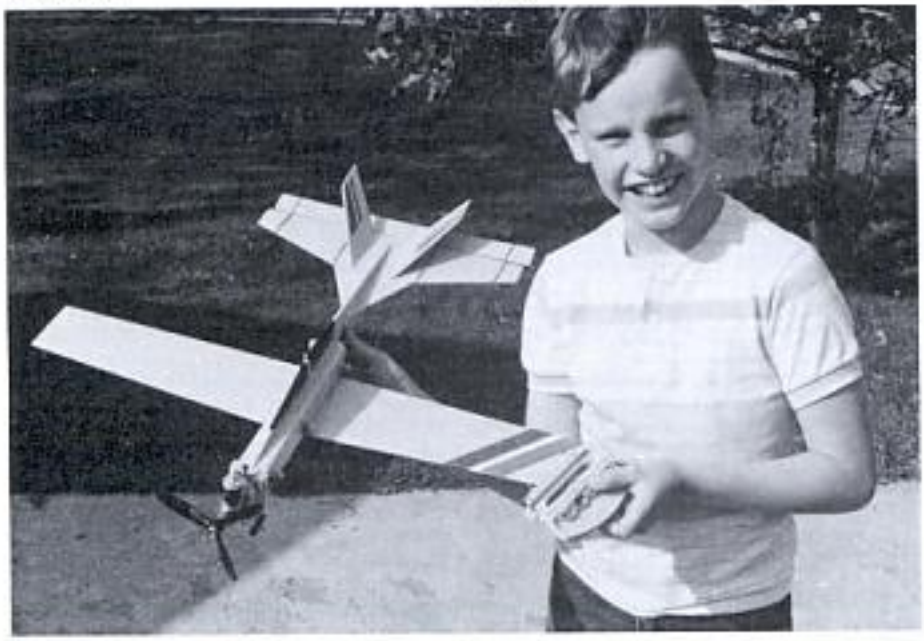


bow grease, and we'll make a true pilot of you!

I wanted a neat, good-performing trainer with a high-tech look suitable to my Jet Age son's frame of reference. Since it would be the first Control Line model he would build and fly, it had to be rugged, simple, easy to build—and look like what a guy like Tom Cruise would fly to boot! So far, except for protesting being grounded by wind, my nine-year-old pilot hasn't registered any complaints.

If you're looking for an easy start in modeling, the Top-Fun is a good bet. Everything about this airplane has been tried and tested over the years on dozens of ½A models, and you may well recognize some of its features from other models.

Rubberbands are the main design element. They hold just about every component in place from the engine to the elevator hinges. The model will survive many a hard landing and give countless hours of fun-flying.



Top Fun's chief test pilot, Michael, is all smiles when it comes to flying. He wanted a high-tech model that looked like a jet! What modeler could resist such a tempting design requirement?

Construction: I've found that when building with kids it helps to start where the fastest progress is easily seen. That means the fuselage.

Fuselage: Cut out the ¼-in. sheet fuselage, the ½-in. doublers, and the ¼-in. dowels. Glue the doublers to the fuselage. When dry, drill the holes for the three dowels, trying to keep them as square to the fuselage as possible. If one is available, a drill press works great. Finish by sanding off all the edges, except for the nose where the firewall will mount, until they are well rounded.

Stabilizer: Cut out the stabilizer, elevator, and two gussets from a flat sheet of medium-weight ⅛-in. balsa. Add the notches to the stabilizer and elevator as shown. The notches are essential for helping the rubberband hinges stay in place, but once the model is assembled you won't know they are there.

Fit the stabilizer into the slot in the fuselage, and glue it in place. Check that the stabilizer is in alignment—i.e., not crooked—when viewed from the top, side, and front. Add the two gussets, laying a ruler alongside each before gluing to make sure they're in alignment with the stab when viewed from the side. Allow to dry.

Sand the edges off round, and try the rubberband hinges. Slip the rubberband over the stabilizer, and move it up to the second notch. Then pull the rubberband from the rear, twist it half a turn, and slide the elevator into the free end loop. Instant hinges! Use the same method for the remaining hinges.

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11. I certify that the statements made by me are correct and complete.
Carl R. Wheeley, Editor and Publisher

time pulling off the head between flights to change gaskets and inserts in order to tune the engine for the varying atmospheric conditions.

One of the nicest features on the engines was the oversize wheel used to turn the needle valve, which doesn't have a locking collet. Instead, a piece of tubing is used to both seal the needle and keep it from turning on its own. The model was easily held in the left hand and the needle adjusted with the thumb. The wheel was also positioned very close to the crankcase so it wouldn't be broken off during a crash.

While at the Russian team's dorm we took several engines apart and found nothing out of the ordinary. The Nelson is probably more powerful, but the Soviet engine is lighter.

Whatever prop pitch the Americans ran, the Soviets probably used about ½ in. less pitch, judging from the airspeed. The Russians rarely ever got up to top speed, as they were always in a turn or accelerating away from their opponents. The Soviets accelerated away at about a 45° angle going up until clear; in contrast, most other fliers immediately turned back in before getting clear.

It seems as if AMA Slow Combat is just begging for some FAI-style flying. Cut the pitch down, and don't worry about the top speed. Only worry about the turns and accelerating out of them. Higher engine rpm with a suction fuel system means better fuel draw and the ability to use a slightly bigger venturi—which adds even more to the power. When the 4mm-venturi-diameter rule went into effect in FAI, the fast guys depitched the props enough to keep the rpm at the same level as with the open venturi. Rather than run a Slow engine at 15,000 rpm, it might be the hot tip to depitch the prop and run it up to 19,000-20,000.

Nowhere do the Soviets have a bigger advantage than in their training. We've all talked about its being advisable for the U.S. teams, but we've never done much about it. The Russians were at the facility in Chaika five or six weeks before the competition. They spent each and every day in individual practice and in flying matches against teammates and mechanics. Their expertise really showed when they flew during the half-hour official practice time allotted to each team without suffering a single midair collision. The Soviet fliers were able to place their models exactly where they wanted them and change course at any time.

The 1988 U.S. Combat team was the most practiced and well-prepared of any to have gone to a CL World Championships, but they still lacked the precision that months of daily practice brings. Fortunately their equipment and natural talents pulled them through, and in the case of Tom Fluker almost got him a repeat world champion title.

Look closely at the pictures of the models. Think about applying the FAI style of flying to Slow Combat, and if you can arrange with your boss for a six-week vacation before the 1989 Nats we'll probably see you in the victory circle.

Top Fun/Wulf

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The twin rudders add a lot to the appearance of the model, but one will do the job if you prefer. Cut them out of ⅛-in. sheet, round off the front, top, and rear edges, and glue them in place on top of the stabilizer. Use the angle jig to keep the two rudders identical. They should be offset just a bit so that the model will want to turn to the right.

Wing: Select another flat sheet of medium-weight ⅛-in. balsa, and trim off the leading edges for the wing sweepback. Glue two pennies to the outboard wing tip for weight. Make up the bellcrank mount and the lead-out guide from ⅛-in. plywood, and glue them securely in place.

Notch the wing for the rubberbands as with the stabilizer. These notches keep the wing aligned on the fuselage, so they too are important.

Install the dowels in the fuselage, and attach the wing with rubberbands. Fit the 2-in. bellcrank to the mount using its original bolt, and begin bending the pushrod. Start by making a 'Z' bend in one end and hooking it to the bellcrank. Then bend it back to the stabilizer as shown in the side view. Mount a ½A control horn on the elevator, and carefully bend the pushrod to the right length. This needs to be done correctly, so don't hesitate to make a couple until you're satisfied.

Continue bending the wire, and make the nose strut and the main gear. The nose strut will mount between the firewall and the engine, while the main gear will be held in place by the wing when the latter is mounted with rubberbands. Add the wheels to the struts, and hold them on with spring keepers.

Making the firewall is your most difficult building task with this model. Saw it out of ¼-in. plywood, and add the notches as shown. The latter are *crucial*, because they keep the engine from flying off! Drill the holes for the engine.

Finishing and final assembly: Remove the rubberbands, and give all the wood parts a final sanding. Apply two coats of sanding sealer, sanding between coats.

When it comes to designing your color scheme, you can take creative license, whether you choose a camouflage pattern or a brighter air show scheme. Make sure all the edges get a coat of paint to avoid any bare spots in the assembled model.

Band the stabilizer and elevator together; do the same with the wing and main landing gear. Mount the engine to the firewall with the nose gear between them, and fasten the firewall securely with rubberbands. The wing, fuselage, and firewall joints need to be well secured so that they won't come apart in flight. Make sure you have enough rubberbands to do the job.

With everything banded securely together, add the propeller and try the balance. If the model is nose heavy, you're okay. If the model balances tail down, you need to add some nose weight. Wrap solder wire to the nose strut until the model balances a bit nose down. Balance the model by holding it by the wing tips ¼ in. from the leading edge.

Before setting out to the flying field, attach the lead-out lines to the bellcrank. These should be made of the same nylon cord as the flying lines. Pack your flying box with lots of rubberbands, fuel, and

ground support items such as a starting battery.

Unreel your flying lines. We used Sig's ½A Handle and Line kit. Make sure the lines are hooked up correctly, and check out the controls. When the handle is near vertical, the elevator should be at neutral. Adjust the line lengths to make it this way.

Test run the engine, checking for any vibration. If there's even a suspicion that the engine is loose, add more rubberbands. Fire it up with a full tank of fuel, and it's off into the wild blue yonder.

For my son and me, the Top-Fun has certainly lived up to its name. We hope it does for you, too.

Vision/Hansen

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ing will make you an instant winner at the Nationals.

Why does vision training make a difference? Most people confuse having 20/20 eyesight (clarity) with perfect vision. This commonly held belief is about as accurate as the concept of the eye as a cameralike lens, something it doesn't resemble at all.

In reality, 20/20 eyesight means that you can use less than *one percent* of your visual skills to clearly read an eye chart at a distance of 20 ft. The other 99% of what the eyes can do is by no means limited to such skills as peripheral vision and depth perception. Rather, vision skills are accurately measured by how you perform in two broad areas: 1) motor skills, or what the eyes can do mechanically, and 2) processing skills, or the ability to put visual information to use.

In the area of motor skills, while it's commonly known that the physiology of the inner ear is linked to the body's ability to maintain balance, fewer people are aware of a similar interconnection between visual nerves and balance. In fact, your optical nerves control 80% of your balance. More gray matter is devoted to vision than to all other sense modes combined.

Tests show that when you turn your head (to watch a model, for example), or simply get knocked off-balance, a conflict is set up in the brain. Since the brain's highest priority is to regain balance, it momentarily shuts off visual input until the body restabilizes. In other words, your visual apparatus still works, but the brain temporarily doesn't compute anything from what you see. The picture, as the saying goes, doesn't register.

Not surprisingly, this vision/brain nexus also determines how well you coordinate body movements and perform activities that involve hand-eye interaction. That covers every aspect of modeling from construction to flight.

To better assess your own motor skills, here are some questions to ask yourself:

- Do your eyes aim accurately and track smoothly? Errors of as little as 2% can cause problems.
- Can your eyes point straight ahead and focus for distance sight as well as converge inward for close work? Especially in cases where people perform excessive amounts of close work (on computers or model construction), the visual stress can have a twofold effect. It can cause the eye muscles to cramp up, lock in on a close-by position, and blur distance sight. It can also cause one eye to kick out, either by floating away from the target or by shutting off (suppressing) data to the brain.
- Do you know where *you are* in relation to where *it is*? A discrepancy between how each of your eyes performs can cause you to