TOP FLITE'S ELDER 40

By BOB BENJAMIN . . .

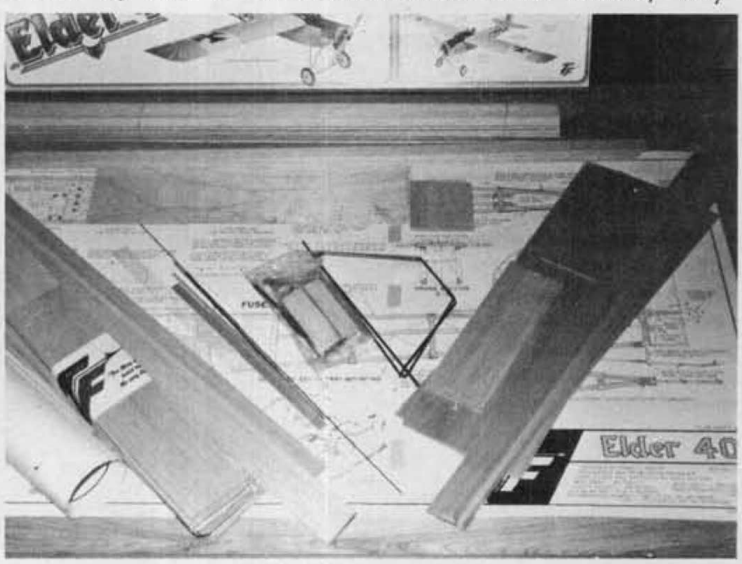
• When Bill Northrop called me a few months ago to ask whether I might be interested in a project that would make use of some of my recent experience in flying diesels, my first reaction was to say yes without waiting to hear what he wanted me to work on. All was well, though; it turned out that he had one of the first of Top Flite's new "Elder 40" kits looking for a good home. Having seen the advance ads, I knew that this airplane promised to be of the slow, easy-flying variety that R/C modelers of a wide range of experience can enjoy. While the manufacturer mentions both two-stroke and four-stroke engines in their advertising, no mention is made of diesels, and Bill thought it would be worthwhile for me to check out the model with one of my Davis Diesel conversions.

Top Flite, for the benefit of those of you who are relatively new to this model airplane thing, is one of the oldest of the kit manufacturers currently in business. My first introduction to its products was in the form of a "Jigtime" (all sheet balsa) rubber-powered Navion, sometime in 1950 or 1951. It flew, by the way, which is quite a tribute to Top Flite, as neither I at age six nor my father knew what we were doing. Over the succeeding years I have enjoyed building a number of somewhat more advanced kits, both control line and R/C, from the steadily growing Top Flite roster of designs, and have never had cause to be disappointed.

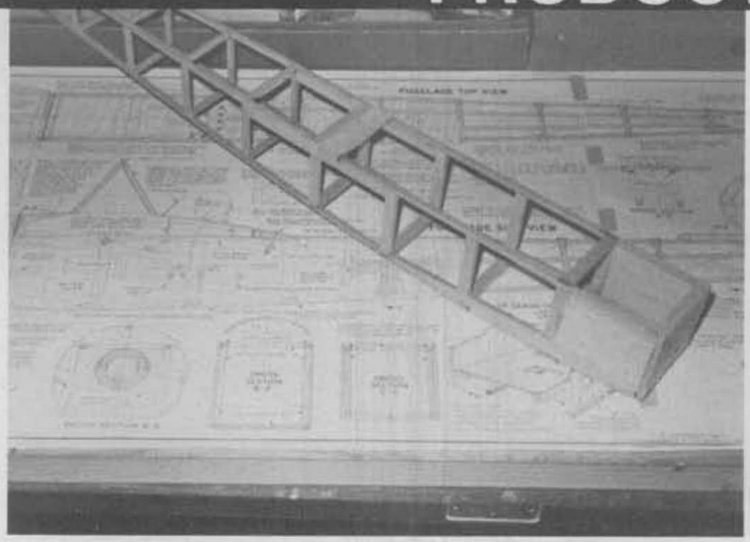
The Elder 40 is a larger, aileron-equipped version of the Elder 20 already on the market. The "40" spans 65 inches, with 783 square inches of wing area, and is intended to weigh between five and six pounds complete. Recommended power is listed as from .35 to .45 two-stroke, and from .40 to .45 four-stroke glow engines, and the airplane is claimed to be a gentle flyer, giving very realistic performance in the manner of a pre-World War I "aeroplane." Top Flite indicates that the Elder 40 would make a good first powered model for a newcomer to R/C flying.

With a few minor exceptions on which I will elaborate, I agree with Top Flite. It has added another winner to its lineup. As befits the "40" class implied by the name, I used an OS .40 ABC with a Davis Diesel conversion head, running on Davis Diesel Power fuel and turning a 14-5 prop. For those of you not familiar with diesels, be assured that this is an appropriate choice of propeller. The .40 diesel actually is more engine than this airplane needs; most of my flying is being done at around half throttle. I would suggest that good engine choices would be any of the Davis conversions in the .25 to .35 range, .30 to .35 sport-type two-stroke glows and, as indicated by Top Flite, .40 to .45 four-strokers. As glow Schneurle .40 is a little too much engine. High-revving super mills are out of place on this airplane; the power isn't needed and the small, fast-turning props they run best on don't work efficiently on a slow ship like the Elder. My diesel-converted .40, on the other hand, was right at home turning that big ol' 14-inch prop at moderate speeds. With this combination, the Elder 40 turned out to be an ideal model for relaxed, "lazy"

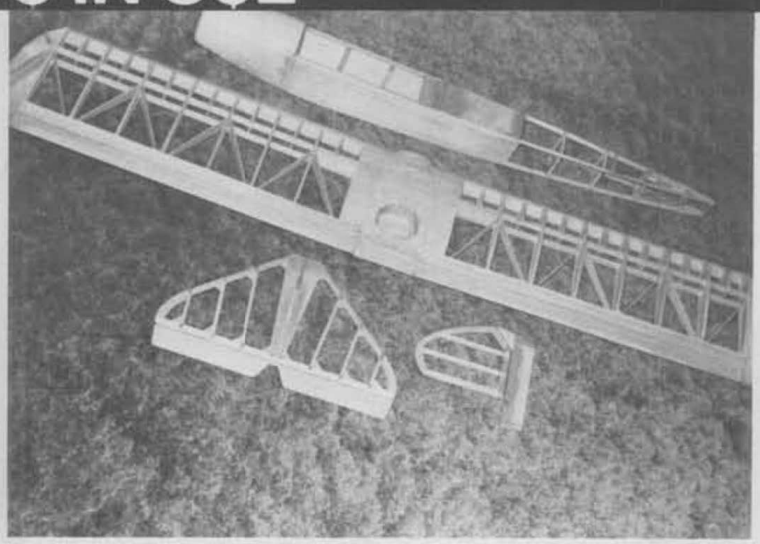
Aviation artist and modeler Bob Benjamin, with his Elder 40. He chose to cover rear portion of fuselage. Builder's choice.



The kit parts as they come out of the box. Rolled plans are highly detailed,

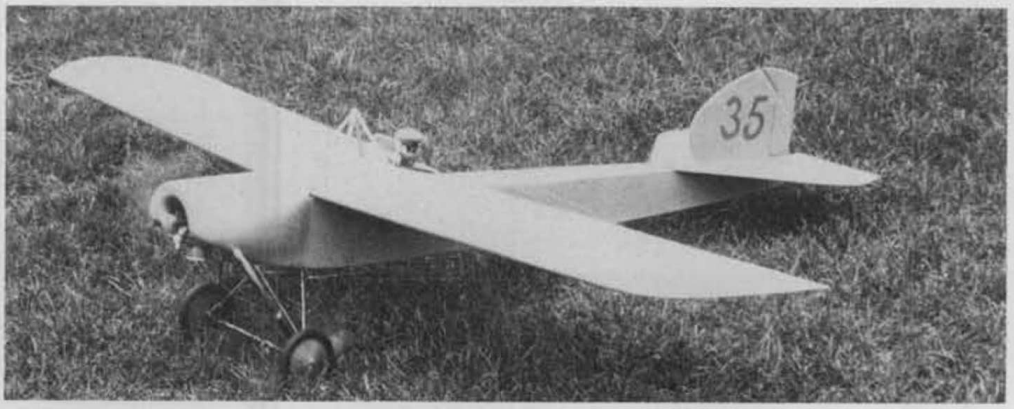


Basic fuselage structure completed and laying across the excellent plan sheet. Note cutaway sketch.



The bare bones all ready for covering. Note the diagonal wing ribs which prevent warping and flexing.

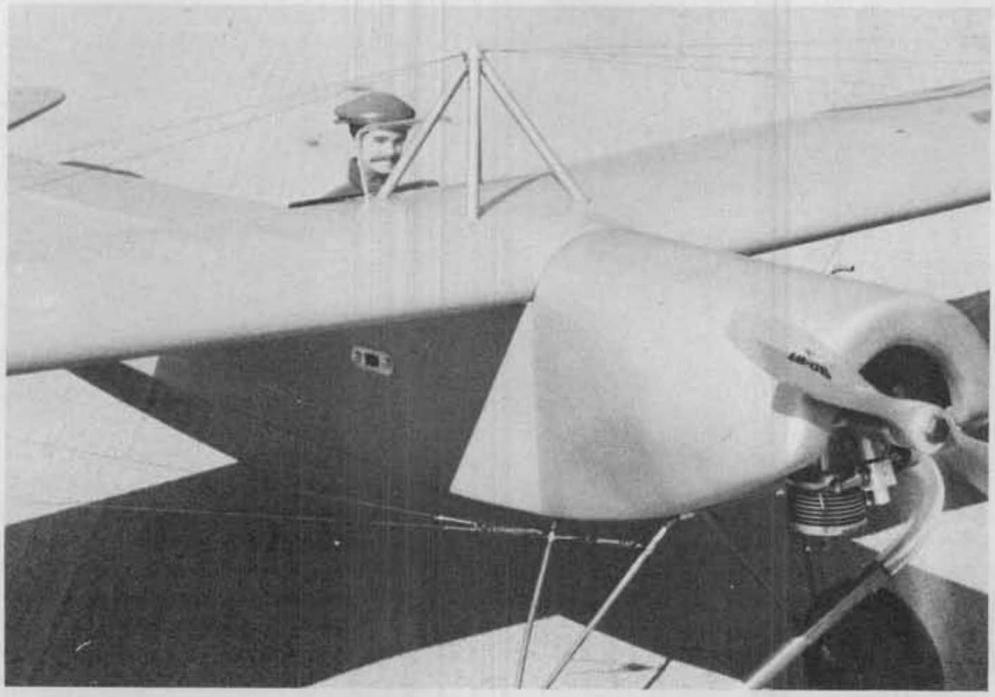
flying. Comfortably stable, it must be pushed into "unusual attitudes," as the full-scale guys put it, but with a little practice, a reasonably accomplished flyer can perform very scale-looking loops, Immelman's, hammerheads, spins, and other appropriate maneuvers. Rolls, as intimated in the construction manual, are appropriately of the barrel variety. (Most of the full-scale crates that inspired the Elder wouldn't roll at all!) Touch-and-goes, as the manufacturer implies are fantastic. All considered, this is one great airplane for flying from a prone position on a calm spring evening with the transmitter propped on the pilot's...ah...centersection.



The Elder being taxied through a wheat field (if you're concerned about scale effect). Diesel 40 is more than enough power. Just fly at low cruise.

I would recommend the Elder 40 as a good primary trainer, with one reservation which is mentioned in the construction manual included in the kit. There is a lot more structure to put together in building this airplane than in some of the other "first time" kits on the market, and a new modeler might best have an experienced friend to help him. In fact, if the manual is followed carefully, no problems should be encountered. In other words, *Read The Directions!*

The construction manual and highly-detailed rolled plans are worthy of special mention. The people at Top Flite have put a lot of effort into them, including not only specifically detailed, step-by-step instructions, but also several very helpful isometric drawings which go a long way toward eliminating any confusion as to how things go together. Careful reading, study of the drawings, and examination of the parts in question BEFORE cutting or gluing anything should prevent most problems. The structure itself is one of the built-up, "stick and stringer" variety. The fuselage is begun as two identical side frames based on spruce longerons, then joined at appropriate points with carefully cut cross members, joined at the nose and tail, and filled out with formers and sheeting. There is more than enough reinforcement designed into the structure to keep things intact during those primary training mishaps. No additional "beefing up" is necessary. The wing is of conventional rib and spar construction, with a suitably heavy two-part leading edge that should easily withstand occasional bashes into the weeds that surround most R/C runways. Designer Charlie Bauer has made one departure from the usual approach to R/C trainer wing construction which I applaud highly. As most of the Elders built are likely to be covered with MonoKote, or a similar film covering, one of the problems inherent in using these popular materials has been anticipated. Although they are highly puncture resistant and very unlikely to warp any structure, film coverings do not always pre-stress a wing enough to give it really good torsional rig-



Close-up of Elder reveals O.S. 40 with Davis Diesel conversion. Long extension carries exhaust goop away from model. Pilot seems happy about the whole thing!

Elder 40. . .

idity, or resistance to twisting. The Elder 40 wing incorporates diagonal bracing ribs which, at the expense of a few minutes of additional construction time, eliminate the problem of wing flexing. I'm impressed by this one!

I followed the construction sequences outlined in the manual exactly, and feel strongly that there is no reason to depart from them. A few minor inconsistencies in the text appeared, which I have duly reported to Top Flite, but a little common sense and study of the plans and parts should clear up any confusion that might arise as building progresses. I reiterate to any new builders: follow the directions! They were written with care by designers who know their stuff, and they'll keep you out of trouble.

I can't help making one other comment on the obvious effort put into this manual. Shortly before taking on this project for *Model Builder,* I had just completed detailed pencil plans for one of my own designers, prior to turning them over to another manufacturer who is now using them to prepare the design for kit production. This puts me in a unique position to appreciate the thought and effort that must go into the compilation of such a comprehensive manual. There's more work in that book than you think, fellows! When you build your Elder 40, take advantage of it.

There were two areas that concerned me while completing the project, and although I have reported my impressions to the manufacturer, I feel strongly that any of you who are now working on an Elder 40 kit should be aware of them. The first is in the landing gear attachment, and is simple to correct. The 1/8 wire L.G. members are attached to 1/4 aircraft plywood plates built into the belly of the airplane with aluminum clips held in place by round-head wood screws. These screws have a very shallow thread, as well as an unthreaded shank, which is almost as deep as the plywood mounting plates themselves. On the first landing, the airplane hit a minor bump in the runway, whereupon the front set of screws stripped cleanly out of the plywood, allowing the gear to swing backwards and make a neat pair of dents in the fuselage. I replaced the furnished screws with a set of 1/2-inch pan head sheet metal screws, which fortunately happened to be on hand in my field box, and went on flying with no further incidents. Sheet metal screws have a much broader thread extending all the way to the head, and should be substituted for the hardware supplied in the kit to prevent your having the same trouble I did. Incidentally, the hardware supplied with the kit is extensive and of high quality.

My second area of concern involves the shaped hardwood center section trailing edge and wing mount which holds two nylon bolts that retain the wing in position on the airplane. This member is attached to the rest of the center section only by a butt glue joint against the balsa structure, and while an expertly made joint provides a safe means of keeping the wing in place, I fear that some new builders might not make a good enough joint. I reinforced my center section by wrapping a piece of two-ounce fiberglass cloth around the en-

tire rear portion of the center section and giving it an ample coat of polyester resin. (Epoxy glue of the flower curing variety would work just as well.)

I made one obvious departure from the "standard" Elder 40 configuration. Instead of the open framework tail section reminiscent of Louis Bleriot's airplanes that is featured in the plans and illustrations, I chose to cover the entire tail, thereby creating a model with the appearance of a pre-war Nieuport. (I know you're out there, Bill Hannan.) This gave me another advantage; because diesels have a somewhat more obvious exhaust residue than glow engines, I made the change to avoid extra cleanup of the otherwise rather attractive open structure. By capping each of the rear longerons with an "L" section made of a piece of 1/8 square and a 1/8×1/4, both spruce, I was able to fair them into the lines of the 1/8 balsa sheet convering on the forward part of the fuselage. A few pieces of 1/8×1/4 balsa fill out the uprights, and give a smooth surface for covering. I also extended the non-functional brace wires to the underside of the wing. Light springs from a typewriter repair shop, or from the local hardware store, are soldered to the lower ends of the bottom wires, and slip over small wire hooks which I soldered to the landing gear structure. Attachment/disassembly takes only seconds. The wires don't bear any load, but the light springs put enough tension on them to prevent sagging, and will stretch and pull free in the event of an off-airport landing, preventing any damage to the structure.

The pilot started life as a "Ken" doll, cut off at the appropriate point of his anatomy. The backwards snap-brim cap was made by cutting a "base," including the lower brim, from a piece of light cork gasket material, sticking this to the head with "Super T" Hot Stuff, and then building up the head, mustache, and turtleneck sweater with Sig Epoxolite. This was mixed according to the directions on the can and applied with one of my old palette knives. The Epoxolite is stiff enough to hold its shape while curing, after which it can easily be carved and sanded to final contour. I painted my pilot with artist's acrylic paint and gave the entire affair a final coat of matte clear Superpoxy

The covering, as might be expected, was Super MonoKote. *Model Builder* (via Top Flite) supplied two rolls of the tan color, which was just sufficient to cover the airplane. The tan shade selected was the basis of my inspiration for rendering this airplane as a pre-World War I civilian ship, all ready for the "Great Race" of 1911. The racing numbers were cut from red trim MonoKote after tracing out paper patterns. The cowl, from the leading edge of the wing forward, was given a coat of polyester resin as suggested in the manual; I added a layer of 3/4-ounce fiberglass cloth, as is my practice with just about everything I build. After sanding the entire nose smooth with aluminum oxide production paper on a block, I added a light second coat of resin and wet sanded the nose to a glass finish. After the entire rear portion of the fuselage was MonoKoted, I masked it off and sprayed the nose with matte aluminum Superpoxy, allowing the paint to extend back a 1/16-inch over the MonoKote to give me a really dependable oil-proof finish. As a final touch, I "dulled" the entire MonoKote covering to give a really authentic antique look. Scott Christensen suggested that he often used fine steel wool for this purpose; I had fine results using the lightest grade of Scotch-brite abrasive pad. This treatment removes the slick sheen which looks out of place on an oldtimer, but doesn't impair the fuel resistance or re-shrink capabilities of the covering. So treated, the tan MonoKote assumes a striking resemblance to the RFC khaki color (colour?) of the period.

After all the final checks of rigging, balance and controls were complete and my trusty World Engines Expert radio had been given a good charge, my friend Al "Big Bird" Alman and I headed for the field, only to have Mother Nature make her usual bid for air superiority. The wind predictably rose to 10-15 mph and got suitably cold. However, it was steady and just about straight down the strip, so we decided to trust in Top Flite and the stable nature of the Elder and give it a go. We need not have worried. With Al manning the camera, my "olde aeroplane" rolled a few yards, lifted her tail, and proceeded to purr past us in a shallow climb that left us ready to hunt up a rerun of *Those Magnificent Men in Their Flying Machines*. She really looks the part! Subsequent testing revealed no nasty habits. The Elder 40 is reassuringly stable, and I would feel no hesitation to turn her over to a beginner (at a safe altitude) even without a buddy box. The small control surfaces, set at the recommended deflections, are sufficient to maneuver the airplane realistically, but do not allow jumpy responses. As mentioned earlier in the article, aerobatics are strictly of the old time variety. It is necessary to lead the airplane a bit, and any climbing maneuver demands a diving entry to build up speed. This is exactly as it should be with a "could be scale" model, as I like to call them, of a vintage machine. Crisp, sharp aerobatics were not intended to be part of the Elder's repertoire, and would look out of place. Relax and enjoy the old girl in her own element; she does just fine!

I did notice, in my airplane, a slight tendency to require some coordinated rudder-ailerson technique in turns at higher power settings, especially while climbing. I find this a pleasing challenge in flying a scale-type airplane, but it can easily be circumvented or avoided either by using a little coupled rudder, if your radio has a mixer, or by rigging a differential aileron setup. I'd suggest that this be done by offsetting the aileron pushrods on the servo output wheel, rather than by bending the aileron horns, as the ones provided are threaded over most of their length, making bending inadvisable. A two-to-one differential (more "up" aileron than "down") would be a good place to

start.

All considered, I am well pleased. The Elder 40 is exactly what Top Flite advertises her to be. The kit is of above average quality, the plans and instructions are well done and sufficient to get a beginner through a successful construction job, and the airplane will serve well as a primary trainer or as a "transquilizer" for the more experienced pilot. •