BOBCAT

By BOB BENJAMIN . . . Here's something that will provide spry aerobatics or easy cruising, and with the quiet purr of a diesel engine, you don't have to leave town to fly it.

HISTORY AND DESIGN PHILOSOPHY

A bobcat is generally recognized to be a smallish member of the cat family, known for a short tail and a high degree of maneuverability. Bobcats are also good looking creatures, but are not nice to be around if you happen to be a rabbit or something like that. Our Bobcat shares all the good attributes of the furry kind, with the extra advantage of being very well mannered toward model builders. The airplane is actually the current product of a design evolution reaching far back into the dim, distant days of single channel pulse. Half a dozen airplanes, ranging from .09 to .45 size, have made a contribution to the airplane presented here.

The Bobcat is not an ultimate anything; considering the degree of subjectivity of modelers' opinion and the vast range of difference in skill level of people who build and fly R/C model airplanes, I doubt that any single design could ever be that. The airplane is my best effort to date at producing a small model with enough aerobatic capability to be challenging to fly, but with enough positive stability to allow the pilot to relax at a reduced power setting and just fly lazy circles in the sky. Although short-coupled, it will not fall out of the air and bite if slowed down or pulled up tight, and this docile nature combined with the quiet, non-irritating sound of the diesel engine around which it is designed, makes it an ideal airplane for close-in, schoolyard flying.

It is not a trainer, though. The Bobcat is a very clean machine and will eat up the whole field on landing if you haven't made an effort to slow it down during the approach. You can't just chop the power and dive for the strip. Moreover, it is a quick little critter, and will rapidly get ahead of a novice flyer.

It is also a design for those of you who enjoy model building. I happen to love good ol' former and stringer construction, and conjured up this airplane to provide a combination of the interesting flight characteristics described and a little building challenge, too. In short, if you have a season or two of successful flying under your belt and feel comfortable with a fast low wing sport ship, and if you like to do more than just join up the fuselage sides and stick the tail feathers in place, the Bobcat is for you.

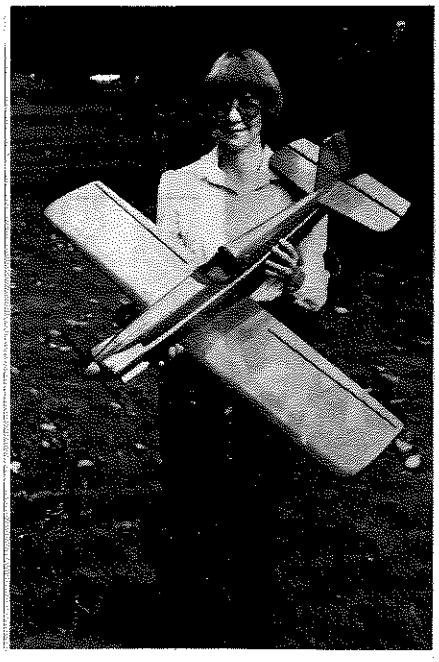
Right now some of you are probably asking yourselves, "How come he put a DIESEL in that thing?" Actually, I did that for several good reasons, all of which apply to you, too. There has been a lot of information tossed around on diesels over the years, and not all of it has been accurate. To be specific, we are concerned here with Davis Diesel Development's diesel head conversions for existing production glow engines. The long and short of it is that they work as advertised. I'll say more about operating the Davis conversions at the end of the article. For now, suffice to say that they are no more difficult to run than two-stroke glow engines, once you learn the differences. They can generally be described as performing extremely well at low and medium speeds, on larger props than would be considered normal for equivalent size glow engines. For several reasons, they are markedly quieter than two-stroke glow jobs, and in most cases will get at least double the running time of a glow on the same volume of fuel. Diesel fuel is readily available by mail order and can be stored just as well as glow juice with reasonable care. In short, they are an excellent choice for the modeler looking for a power-plant for a trainer, sport model, aerobatic (including competitive aerobatic) airplane, or scale model.

The scale folks especially need to take a good look at the ability of diesels to swing big, long props at effective RPM's, without straining or over-heating. Diesels also happen to be very tolerant of exhaust back pressure, and just don't mind at all if you stick a long muffler extension on them. Add to all this, of course, the complete freedom from concern with glow plugs, batteries, and connectors. Nothing is the perfect answer to all problems, but diesel conversions will solve a lot of them.

One point is worth elaborating on. I mentioned low and medium speeds. This does not mean that diesel powered airplanes won't go fast. A little experimentation with propeller selection will result in great reward to the diligent. The correct combination of diameter and pitch on an engine that is happy with a lot of prop ahead of it can make your airplane go like greased scat. In short, they don't have to scream to go fast.

Several anecdotes from the early days of the Bobcat's life in public will illustrate some of what I'm talking about. I take care to give my engines proper break-in, and had put about an hour of bench time on the Davis/Fox combination before putting it in the airplane and then spent another half hour setting up the servo throw, idle adjustments, etc. In other words, no more than any careful modeler would expect to spend getting an engine ready for flight number one. The airplane had had several flights with the engine running at conservative settings "in private" before being brought out into the cold light of public scrutiny. With a total of no more than two dozen starts and a little over two hours' running time, I flew the Bobcat six times for a group of fellow club members. Four of the starts were on the first flip. That's by hand. I don't use a starter. The other two starts were complete within thirty seconds.

On the same weekend I had occasion to meet Al Alman at the Puget Sound ROC's field, having promised to bring out the new machine for him to see. If you read Al's words of wisdom regularly, you already know that he is aware of the fine qualities of Davis's diesel goodies, but that he looks upon small airplanes with a jaundiced eye. Al asked me to tell you that he actually stepped down from his position as guru of the Big Birds and admitted that he had finally seen a small model that flew in a manner of which he approved.



Teryl Benjamin, Bob's child bride, with the Bobcat. She flies C/L, not yet into R/C.

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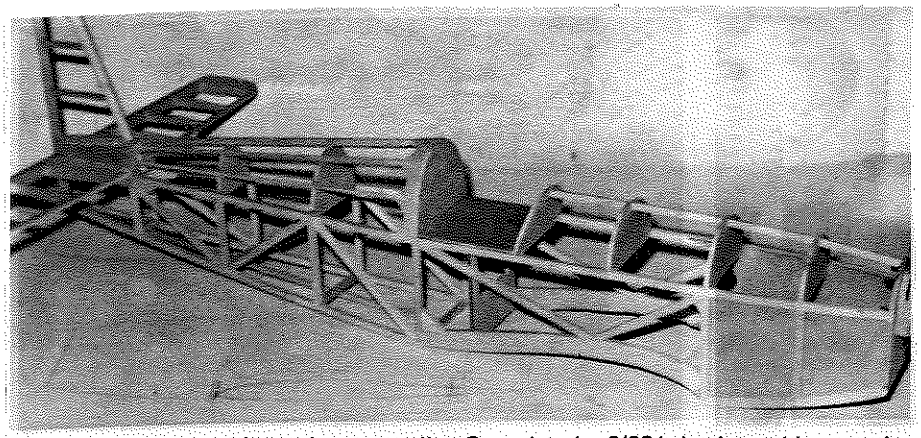

Next step is sheeting of forward upper cowling. By moistening 3/32 balsa sheet with ammonia and water solution, and using cyano glue, the job can be done without pins and cuss words!

This made me feel good, because Al has seen a lot of planes made by a lot of capable designers, and he agreed with me that the Bobcat is a smooth little beast that looks, and flies, like an airplane.

The following weekend I had the Bobcat in the car when I stopped to watch the fun at the ROC's four-stroke meet for a while before going to my own club field to do some more test flying. Several of the guys running the meet saw the airplane in the car and asked me to bring it out, even though it wasn't a four-stroke, and give a demo. While I was flying, my friend Emil (Ikon N'west) Neely walked over and ended up being given first "turnsies" on the airplane. The result of that was that Emil and I sat up until a late hour at my place, discussing Ikon's bringing out a larger version of the Bobcat, probably 70" to 80" span, as a kit. There will probably be a shoulder wing offshoot as well.

Perhaps all this testimonial sounds too good to be true, but it is all for real, and just makes me feel extremely good, because I have put a lot of thought into developing this combination of airplane and engine to the point that it will do all these good things for you, too. So, if you have had a little building and flying experience and want a neat model that looks and flies like an airplane, and that will show off all your building skills, read on.

CONSTRUCTION

You have to build this one. Basically, the approach is good old rubber job stick-and-former, with a little plywood and sheet thrown in where it will do some good. DO NOT start adding blocks and braces, there is plenty of strength in the airplane to withstand anything I think you might make it do in the air. Its immediate predecessor, which is almost identical structurally, was fooled by Mother Nature one day when a crosswind takeoff was messed up by a gust and became a downwind romp through the weeds at the end of the strip, resulting in a high speed cartwheel. Result: a broken prop, a dislocated wing attach former, and a three inch split along the lower left longeron behind the wing. That's all.

Several choices should be made before you start cutting wood. The airplane is such a winner with the diesel that I think you should give honest consideration to using one. There are three engines suitable for this airplane for which Bob Davis makes conversion heads: the Fox .15 BB, the O.S. .10 FSR, and the SuperTigre .11, all of which are Schneurle port engines. The Fox is the longest; either of the others might allow you to shorten the nose a bit, which would be OK.

While you're at it, decide whether you want to build up the cheek cowl. The appearance is worth the work, but a simple inverted installation, or a sidewinder, faired into the spinner, will certainly work. My idea was to approach the appearance of an early '60's homebuilt one-seater with a small flat four aircraft engine, or perhaps a converted VW. The four ounce tank with the .15 diesel gives me a twenty minute plus capability at full throttle, should I want to do that. A smaller tank would work.

The airplane exhibits a slight pitch-up tendency at full throttle, with the .15. This happens to be a characteristic of most full-scale planes, and I have reasons for not objecting to it in this model. If you don't like the idea, add about one degree of downthrust. There is about one degree of right thrust built into my airplane, and this seems to handle in-flight torque well. The combination of a relatively large prop and a short tail demands some right rudder correction for torque, P-factor, and precession on takeoff, but extra offset might be excessive for flight trim. Set yours up the way you want.

There is a hint of positive longitudinal dihedral built in. (That's what makes the nose come up in a dive. Too much causes zooms and stalls coming out of turns, as in primary trainers.) Leave that alone. You might want to add one degree of dihedral per wing panel to make the airplane more groovy in roll. The CG range indicated on the plan shows a forward CG which works well with the short tail moment. I'm flying my airplane at that location, and it will spin readily and snap on command fast enough to make you dizzy, but is docile on high-G pullouts and landings. I have flown the airplane at the aft limit shown with no problem other than a tendency to wing rock if the approach is dragged out, and to do a reluctant half snap if forced into a high speed stall. The airfoil is a NACA 2412 and looks familiar because you have seen it on your old friend the Falcon 56, among others. It also happened to be the section of choice when Cessna designed my 1946 Model 140, and it has endeared itself to me in that form.

Start building with the wing, so you will have it to fit the wing saddle to when you work on the fuselage. Try to find some uniform medium weight "C" grain balsa for the ribs, which were the first thing I made. I enjoy cutting, so I made a pattern, traced, and cut. If you do this, leave a little extra wood on the ribs so you can stack them on two pieces of spar stock and sand them to final contour as a unit. Cut from a metal template or slice them off a block if you want. There are two patterns, W-1 and W-2. Notice that several of each are modified to fit various combinations of spars and doublers. A moment of study of the wing plan will make it clear what you need.

Cut all the ply doublers and spars and join everything up flat on the board so that all your dihedral angles are the same. If you have a hinged building board, you can put both panels together at the same time. I built one panel with the spars hanging out to one side, then rocked the whole thing over and built the other side. Note that you must shim up the T.E. as indicated on the plan to get things to lie flat at the front spar location. Slot the L.E. and T.E. for the ribs, slide the ribs over the spars, line everything up, and glue. I use regular "Hot Stuff" for jobs like this, and am well pleased. A sliver of scrap will fill any stray crevices and give you a solid bond. The oft-touted trick of wiping aliphatic resin glue over the outside of the joint is a waste of time, and won't add much except weight. A proper joint is made by the adhesive between the mating faces of the material being joined. If the joint fits properly, CA glue gives superior results. I have subjected such joints to the same break tests required of full scale wood aircraft structure, and they always pass. If the joint doesn't fit well, fix it, don't blob it with dead weight.

Notice that the center W-1 is shortened to clear the L.E. and T.E. spar joiners. Bevel the rear edge of your landing gear blocks to fit them snugly against the front of the spar joiner, and adjust as necessary to get a good fit into the rib cutouts. When the blocks are in place add the 1/8 square balsa spar caps full span, top and bottom, and block sand as needed to get proper alignment with the edges of the ribs to receive the top and bottom L.E. sheeting, which goes on next, followed by the center section sheeting.

Make up the aileron horn assemblies, using a lubricant inside the tubes to keep them from binding later when you can't get at them. Fit the center section T.E. with the horn assemblies in place, trimming for clearance and proper movement as necessary, then recess a space for the semi-circular wing bolt reinforcement plate and install that. True up the tip ribs and install the tip blocks, which may be hollowed if you wish. Cut out and shape the ailerons

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and pin them in place temporarily but accurately, then carve and sand everything to a pleasing aerodynamic shape. When that's done, sand the whole structure as smooth as you can get it, take a rest, and sand it some more. Pre-fitting hinges, making up the landing gear, cutting and lining a servo "nest," and pre-drilling for the landing gear screws will take the wing as far as it can go until you have a fuselage to go with it.

The tail surfaces don't need much explanation. Take the time to slot the edges for the stab and elevator ribs as indicated. The stab L.E. on my airplane is spruce, as a protection against the big fat weed that is lurking in the grass waiting for me to drop it in short some day. That feature has saved me repairs in the past on other models. The elevator joiner is a piece of 1/4 dowel; fit this carefully so the glue joint will be solid and not let you down. I make my own horns from micarta for small ships like this and mortise them into the structure. If you prefer the nylon variety, add a block where necessary to provide an anchor point. The ribs are just 3/32 sheet left oversize and block sanded to a slightly rounded contour after assembly.

The vertical tail and rudder are straight 1/4-inch stock, and are flat. The bottom area of the vertical tail is filled in with a single piece of 1/4-inch sheet; this doesn't show clearly on the plans, as it lies directly behind the 1/16 fairing. Leave a little extra material on the bottom of this filler, so you can match it accurately to the top of the stab during assembly. Also, leave enough material on the vertical tail L.E. to extend down through F-10, which is cut out to accept it after assembly as part of the rear deck.

The fuselage is begun as two side frames, just like the old rubber freeflight jobs. I like the extra strength of spruce, but good hard balsa will do OK for the longerons, if you prefer. The side elevation on the plans is a projection of the structure as assembled; the longerons are actually a little longer than that, and I have shown the true lengths for them, as well as the assembly positions for the uprights, as dashed lines on the plan. The diagonals will fall into the correct position automatically. My reference for these corrected positions is the wing, and they extend outward from the L.E. and T.E. former stations toward the nose and tail.

Add the 1/32 ply doubler on the inside of the nose, making sure you have a left and a right side. The doubler will butt against the back of F-1 when assembled; the longerons extend through F-1. The wing saddle is made up of two pieces to keep the fabric covering from adhering at random up away from the edge, where you don't want it to stick. Join the sides, using a square to assure accuracy, at F-3, F-3A, F-7 and the 3/16 sq. crosspiece at the T.E. The sides are parallel through this area. Add F-4, F-5 and F-6 to stiffen things up, then join the nose and tail by working out from the wing, joining one station at a time, over the top elevation on the plan so you don't build a banana. Don't forget the beveled 1/4 sq. corner blocks behind the firewall. Add the top, bottom and side stringers, tailwheel mount, and fillers between the stringers at F-7. Build up a fillet under the stab L.E. to insure that the stab lies at 0 degrees relative to the top longeron, then attach both the horizontal and vertical tails and add the various pieces of fairing and fillet *(when Cliff Tacie isn't looking! wcn)*

True up the wing center section and the wing saddle and prepare whatever wing mounting hardware you choose to use. If you plan to fiberglass the center section, as I strongly urge you to do, make allowance for the thickness of the glass. Square everything up to the best of your ability and mount the wing using the bolt and fixture on F-6, then mark and drill for the locating dowel that goes through the L.E. and forward plywood dihedral brace and keys the wing in position at F-3A. You must do this before the lower nose sheeting is in place.

Sheet the top cowl with medium soft 3/32 balsa. I started by making paper patterns slightly oversize and attached the sheet at the center of the top cowl stringer, using "Super T" Hot Stuff and a liberal laying on of hands. Wet the skins with a 50/50 mixture of water and ammonia and work them gently into a curve before you try to pull them into place. Take your time. Using "Super T" and patience, it should not be necessary to resort to pins or clamps. It would probably do your composure good to have a bottle of "Hot Shot" accelerator handy. Fair out the nose uprights with scrap sheet to hold the side cowl sheeting out in a nice shallow curve, blending with the 1/8 side stringer and ending up lying flat against F-1. Finish up any loose bits you missed, fill any crevices you may have left using scrap wood and Hot Stuff, and sand, sand, sand. Using a piece of medium/light grit production paper on a block is the best way I know to true up side frames, sheeting and stringers into an accurate structure that will be worthy of your finish sanding and that won't embarass you later at the field by poking old nasties out through the covering.

Mount your engine, using 4-40 screws and blind nuts to hold the mount to the firewall. I had to trim some metal off the front of my Fox mount to clear the inside of the cowl. With the engine in place and all thrust offsets made, make and tack in place a 1/8 ply cowl base plate and a nose ring of 1/2 inch or thicker balsa, which must fit the spinner you are using. Fix these front and rear cowl faces into position with top, bottom and side "keels," then remove the whole mess from the nose, fill in with big chunks and scraps of balsa, and do the old "carve and hollow" routine. You will have to go back and forth between the nose (with the engine in place) and the whittling area several times to get it right. I used a rotary file on a small power grinder to open up the inside. Keep the walls thin in order to allow proper air flow through the cowl. If you choose to add the cheek cowls, make the front sections from blocks sawed to shape and glue them in place on the cowl body. I recessed the rear 1/4 inch of these blocks 1/32, then made a paper pattern for the rear cowl skin, transferred it to 1/32 ply, being careful to align the grain for easy bending, and Hot Stuffed the cowl skins in place after wetting and prebending. This part is actually easier than it sounds. The rear cowl skins do not attach to the fuselage behind the firewall, but a real close slip fit.

I strongly urge that you fiberglass the cowl, even if you use only a simple arrangement and don't build the full cheeked version. If you choose to use fiberglass (polyester) resin anywhere on the airplane, remember that it will not cure if it can make any contact at all with epoxy material, cured or otherwise. I have read reports that the five-minute varieties of epoxy will not inhibit curing of polyester, but have not had a chance to check that out personally. To be safe, don't use epoxy anywhere that you intend later to use polyester for reinforcement or finishing.

My cowl was reinforced and finished with a single layer of 3/4 oz. glass cloth from Sig, attached with Sig's polyester resin. Get some, read the directions, and give it a try. It is very easy to sand out if you use good quality aluminum oxide paper on a block, and the dust is much enjoyed by the vacuum cleaner. Use a throwaway mask from the drugstore if it gives you the sneezes. A second coat of resin to smooth up the outside and to coat the inside thoroughly, will bring the cowl up to strength. Double check the fit and make up mounting brackets to hold everything in place. Don't forget to leave plenty of room around the cylinder head for free air flow. The pictures of my installation show an arrangement that has worked well, with lots of room for cooling and access, but with enough cowl to give a pleasing contour. If you are experienced enough to be doing this at all, you will have your own ideas.

Fit the tank, route the fuel lines and cut the necessary holes for the throttle control system. I suggest that you test mount your entire radio system now, before covering, to avoid unpleasant changes later. I used a kit-built Ace Airborne system, working off my World Engines Expert transmitter, with Bantam servos and a standard 500 mil. battery. This all fits with no problem, with the battery going in nicely under a Sullivan 4-oz. tank, and the receiver dropping into the area just behind the leading edge formers. I mounted my switch on the 1/16 ply cockpit floor.

When everything fits and works the way you want it to, pull the engine and radio out and put them away so you can do a good job of covering and finishing. I fiberglassed the whole nose and wing section of my airplane, and suggest that you consider doing the same on yours. The weight gain is not a problem if you do it right, and the increase in strength and durability is tremendous. As mentioned in

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my comments on the cowl, I used Sig products here, as well as in the construction and covering. Their balsa and plywood are of consistent good quality, and I use their fiberglass cloth and polyester resin because they are fairly priced and predictable. Unless you want to start a career as an experimenter, stick with established products intended for model airplanes when dealing with fiberglass and resins, as there is a wide variety of stuff on the market. Use 3/4 oz. per square foot cloth on this airplane and cover the entire sheeted portion of the fuselage and the wing center section to a point several bays beyond the center section sheeting. Cut your glass cloth oversize and have a jar of acetone or dope thinner and a new, sharp blade at hand.

READ THE PRECAUTIONS before catalyzing polyester resin. Using a disposable brush, paint resin directly through the cloth at the center of the piece as it is held in position. More than ample resin will penetrate through the weave and bond it to the underlying structure. Work outward from the center, brushing plenty of resin through the cloth as you go. The cloth will follow nearly any compound curve and stick down nicely. If you get a wrinkle that won't give up, slice it with your blade and double up that area. Don't be afraid to overlap pieces of cloth. When everything is covered, put the whole mess aside in a warm, secure place to cure and get yourself cleaned up well. After a few hours, when the resin has nearly cured, but is still flexible, you can easily trim off any loose edges of cloth.

When everything is cured solid, attack the glassed areas with medium fine production paper on a block and sand away resin until you just begin to expose the weave of the cloth. If you leave extra resin beyond this point, you'll lend truth to the claim that fiberglass adds too much weight. If the resin is to be your final finish prior to putting on color, such as on the cowl, you can put on another light coat and wet sand it to a glass finish; otherwise, one coat is all you need and will provide a fine base for the covering. Make sure to get some resin inside the nose, where the tank will later be doing its best to leak fuel on things.

My airplane is covered with Sig's Silray (50/50 silk and rayon). This has all the good qualities of silk, but is a little less expensive and seals with somewhat less clear dope than silk. If your local dealer tries to tell you that no one uses it any more, order it directly from Sig. Sig, by the way, also handles my favorite Banner wheels, which are lighter than the more common brands and look great, but are sometimes hard to find.

My finish started with two coats of full strength nitrate clear on the entire structure, well sanded, prior to covering. I gave the covered structure five coats of clear, thinning the last three and wet sanding lightly after a suitable base had been built up. The final finish is K&B Superpoxy, sprayed in one mist coat followed by one full flowed coat ten minutes later. Superpoxy is easy to work with, can be brushed (using the correct catalyst) if you don't have a spray outfit, and cures dust-free in minutes if you preheat the catalyzed paint by placing the container in a pan of nearly boiling water for a few minutes before applying it to the airplane.

One thing to watch out for when using an epoxy finish, that I have never seen mentioned in print, is the use of plasticized dope as a base. Any plasticizer I have tried will leach into the thinner used to cut the epoxy for spraying and leave you with a slack covering at the time the epoxy cures. When this happened to me on another project, I had to wait two months for the covering to tighten up. I talked to a finish specialist at K&B and was told that the fix is just not to use a plasticizer in dope under an epoxy finish.

Nitrate clear, by the way, is the ONLY substrate to use under epoxy, which will not bond properly to butyrate. The epoxy provides all the fuel proofing you will ever need, although this isn't a concern on a diesel powered airplane; diesel fuel won't bother any finish that I'm aware of. If you don't want to use Silray, I would suggest that an excellent covering/finish combination would be one of the newer Tex iron-on fabrics, or Silkspun Coverite, two coats of nitrate clear, and a top finish of Superpoxy. As nice as they are, these heat shrink fabrics really should be given a finish coat to prevent dirt absorbtion and oil infiltration under seams over the life of your airplane. I really don't care for plastic film coverings. I ceased using them after being very disappointed with their lack of long term durability and failure to contribute to airframe strength.

Reinstall all the mechanical and electronic stuff and make sure that everything fits properly and works the way you want it to before you even think about taking the airplane out the door. A good charge on the power packs goes without saying. I make a practice of spending as much time as is necessary setting up the engine for proper fuel flow, idle adjustment and whatever BEFORE I go to the field for the first time. If you aren't fortunate enough to be able to run engines extensively at home, at least go out early so you won't tie up a frequency, disturb the guys who are flying with runups in the pits, and generally be tempted to put the ship up before it's really ready. Don't fly the airplane until you are satisfied that everything works exactly the way you want it to.

COMMENTS ON FLIGHT TESTING AND DIESEL OPERATION

The CG on my airplane came out at the forward limit shown on the plans without any trim weight added, using the Davis/Fox.15. Although I have flown it at the aft limit shown, I'm happy with it at the forward point. The wide spaced wheel position, with the axles under the leading edge of the wing, will give you extremely stable ground handling with no tendency to ground loop on rollout. I have moved my axles forward slightly, since the strips I fly from have patches of thick "grabby" grass, and have yet to turn the plane over or hurt a prop.

As mentioned earlier, the combination of a short tail and a lot of propeller results in a swing to the left when the power comes up. Just be ready for it and you'll have no problem. In the air there are no surprises, just a fun small airplane doing its thing. Al Alman summed it up by saying, "It's slippery, but not squirrelly." Spin recovery takes about a half turn after releasing all control. Full rudder-elevator snaps from level flight are very quick; I can't always stop right side up, but that's me, not the airplane. Speed comes up quickly with the nose down, so set up your landing with a proper pattern and bleed off airspeed on downwind and base, or the Bobcat will eat up the whole strip and still not come down.

If you take my suggestion and try a diesel, you'll have a sheet of instructions to read before you try to start the thing. Please believe me, diesels are no more difficult than two-stroke glows. You just have to admit that they are different, and allow yourself time to develop a new set of skills. You didn't get to be at ease with glow engines in one weekend, did you? Practice starting and adjusting the diesel at home, or at least by yourself, before flying. Fuel is no problem if you order it in advance from Davis Diesel Development; many fliers are mail ordering fuel these days anyway, so what's the difference? The fuel, by the way, is a big part of the reason that diesels do all the good things they do. The power in diesel fuel comes from kerosene, not methanol, and there is a lot more potential heat energy in petroleum-based kerosene than in alcohol for a given volume of fuel. Some people have objected to the smell of diesel exhaust, which is different from what you are used to. I happen to like it. If you don't, get in touch with Bob Davis. He will soon be marketing a concentrate of oil, ether and certain additives to which you will be able to add kerosene in the form of scented lamp oil from your favorite hardware store. (Yes, it does work.) Bob says one of his friends has dubbed the resulting combination "flavored fuel." Now you can perfume your favorite flying field!

The propeller size recommendations you'll get with your conversion are correct. A lot of work went into engineering these things, and those sizes work. If you try to fly your diesel with the prop you would use for an equivalent size glow, you will be diasappointed. Read and believe!

Spend the time to set up a good idle. Your idle adjustment may be somewhat different from what you would expect of a glow engine. Experiment! I have mine set up so the airplane will not move on close clipped dry grass in the pit area, and have never had the engine cut out on idle in the air.

Half the challenge, and reward, of building and flying these things is in learning to make something new work well, so go for it! Order your plans from M.B. and a conversion kit from Bob Davis and be the first kid on your block with a diesel airplane that really performs. •

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