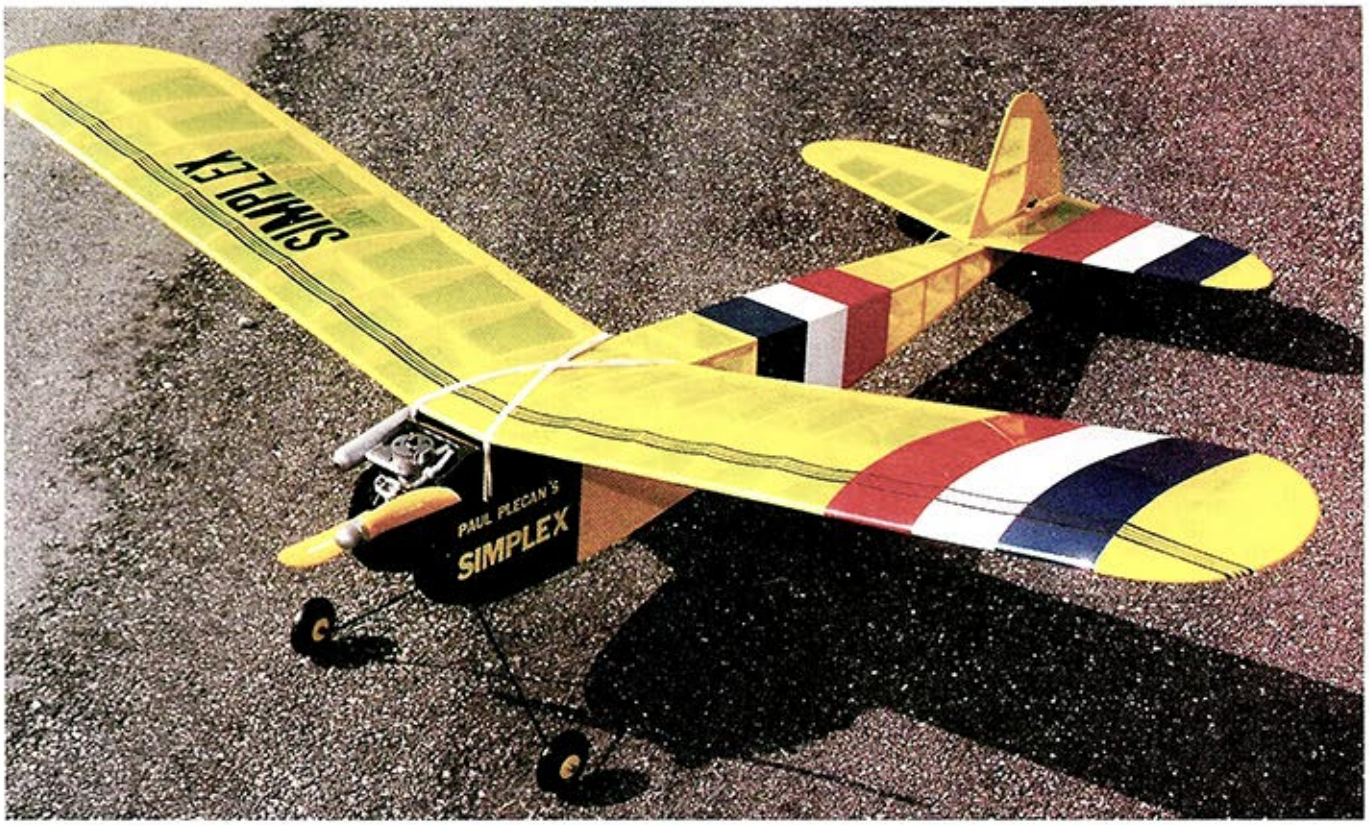


Paul Plecan's 1941

SIMPLEX

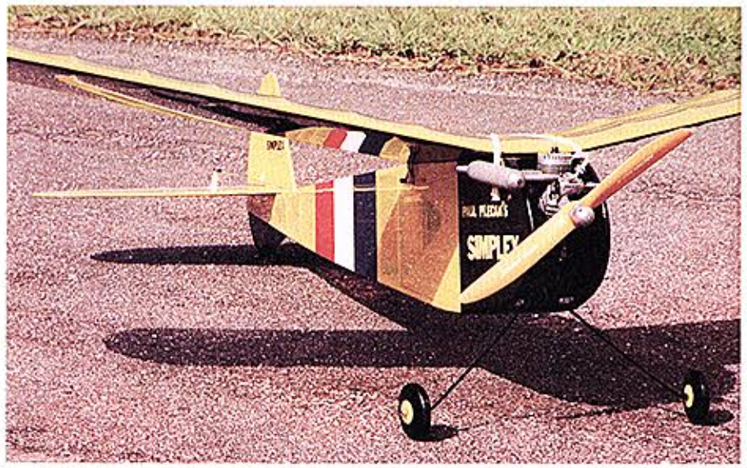
By STU RICHMOND... It's a widely accepted fact that Old Timer free flights with radios installed make excellent R/C trainers, and the Simplex is one of the best. Ultra-simple to build, too.

• Much of the fun of reading model magazines is the chance to see and study construction articles. The first thing I do each month when *MB* arrives is check out the center spread and then look over the remaining plans.

We model builders owe much to the talented handful of plans tracers and draftsmen who do the needed work for construction articles to appear in print today. In the late '30s and into the '40s, Paul Plecan traced and drafted many modelers' plans for publication. You can bet that at times he must have been fed up with the designer's complications and intricacies. When Paul designed his own few models they reflected his urge for non-complication. His Simplex was the peak of simplicity. A quick look at the Simplex plans shows this to be the epitome of fast, easy construction.

I've always been sensitive to the R/C training needs of newcomers to our hobby. When I found the Paul Plecan construction article for his Simplex in a 1941 *Air Trails* magazine, it seemed well worthwhile to scale up the plans and build it, but to incorporate equally simple modifications like hardwood wing spars, about 7 degrees of downthrust along with 3 degrees of right thrust, about 40 percent of the fin converted to moving rudder and about 15 percent of the stab converted to elevator and sheet balsa sides up front locked together by a plywood servo tray. I figured the resulting Simplex would probably be about the simplest building and flying R/C trainer in the air—and I was right. Rank beginners have had fun with my prototype.

Hand launching the Simplex is easy, especially in a slight breeze. Stu recommends this instead of ROG takeoffs, as the forward wheel location makes for tricky ground handling. Maybe a tailwheel would help?



The 12x6 Antique series Master Air Screw prop parallels the shape of the old Flo-Torque props of the 1940s. K&B Sportster .20 turns this prop at 5000 rpm max, 1400 rpm idle.

Flights average 20 minutes with the K&B Sportster .20 on a 4-ounce Sullivan slant front tank. We've had lots of long thermal flights. We've had to cut the power to idle and spiral down repeatedly from Florida thermals lest we lose the model visually. Flying buddy Ed Stone got the Simplex into a Florida boomer (thermal) of the greatest vertical rise rate we'd ever seen. He flew it the highest it's ever been!!

A few building notes:

1. The 1/4-inch wide by 3/4-inch high wing spar *must* be of spruce or bass for adequate strength. It may require gluing together two or three pieces to get up to final size. Strength is then plenty as the model will hardly loop and won't be aerobatic.

2. The tail should be built of firm but very light balsa as there is practically no nose moment to counter the weight behind the wing spar. Balance point should be at the wing spar.

3. Trust me—one elevator is sufficient and simplest. Yes, full "up" does give a bit of right turn and full "down" gives a bit of left turn. No problem near neutral.

4. Construction is well-suited for today's iron-on coverings and is *not* strong enough for silk and high-shrink dope.

5. Keep all your radio gear as far forward as possible. My 500 mAh battery pack is right behind the landing gear and my model balances right on the wing spar with no extra weight added.

A few aerodynamic notes:

1. Most of the drag from any normal model wing comes from the wingtips—same on full-size aircraft. By adding washout to each wing panel the drag is minimized at high speed and increases at nose-high lower speeds. Modern jet fighters, Piper Cubs and 747's all feature washout. The Simplex benefits from washout similarly. Just twist the covered wing and heat with your heat gun until you attain the specified washout shown on the plans.

2. These plans show the correct downthrust and about three degrees of right thrust, which helps counter the torque of the big prop.

3. Original plans showed a 13-inch prop on a Dennymite engine. This replica flies best with a Master Air Screw Antique Series 12x6 that even looks like the old Flo-Torque props. My engine is adjusted to not exceed 5000 rpm and it idles all day at a fantastic 1400 rpm. I chose a new K&B Sportster .20 due to the muffler's excellence in annoyance suppression (no, I don't like the word "noise"). This engine, in conjunction with the 12x6 at 5000 rpm yields quietude that surely rivals electric flight! The prop/rpm combination yields two to three times the climb rate of current ferrite electrics.

4. You can easily surpass 15 to 20 minutes of flight time every flight on the four-ounce fuel load.

5. The wing loading is so low it lets the Simplex fall in the "super plane" category on Francis Reynolds' interesting cube loading chart. Yes, there is a relationship between carrying capacity and the volume inside our wing covering. The Simplex's cube loading is so low compared to electric that you'll actually be able to enjoy armchair R/C flying due to the neat slow floating flight.

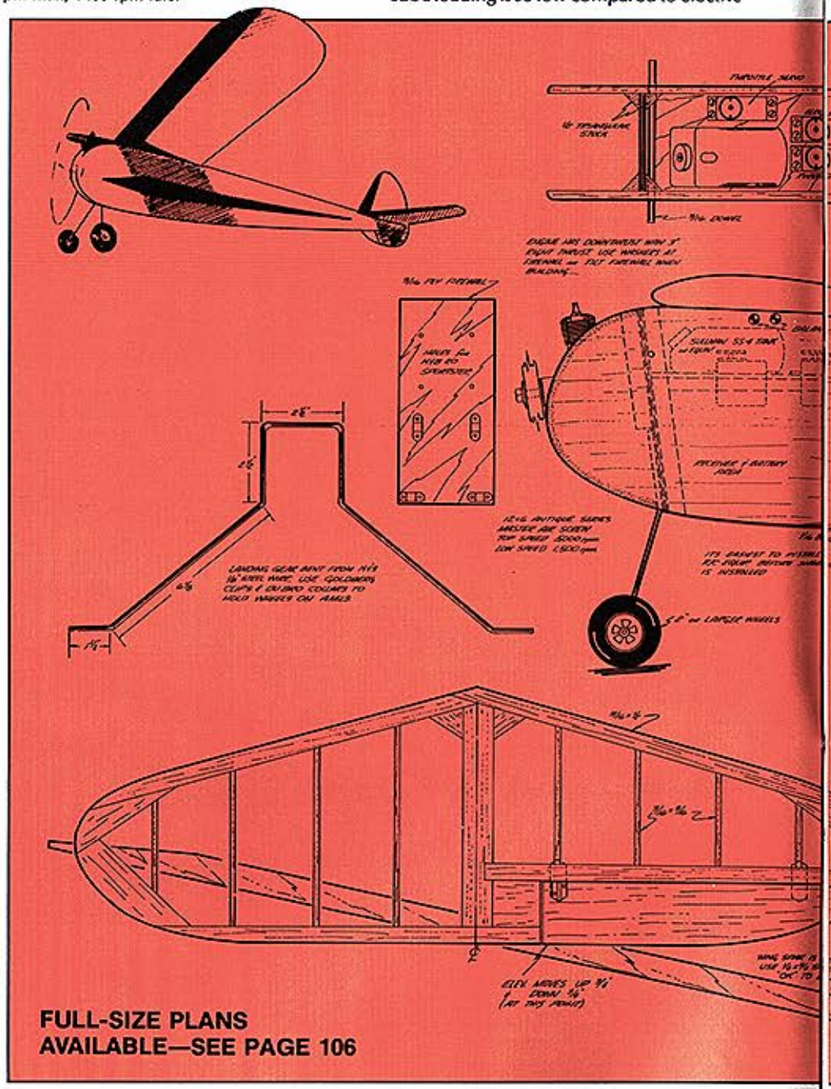
6. Adding the automotive striping tape near the 10% chord point on the front/top surface of the wing has an aerodynamic turbulating effect. The tape acts like a multi-spar wing and increases the thermal floating abilities. For maximum fun, don't omit the tape.

A few engine notes:

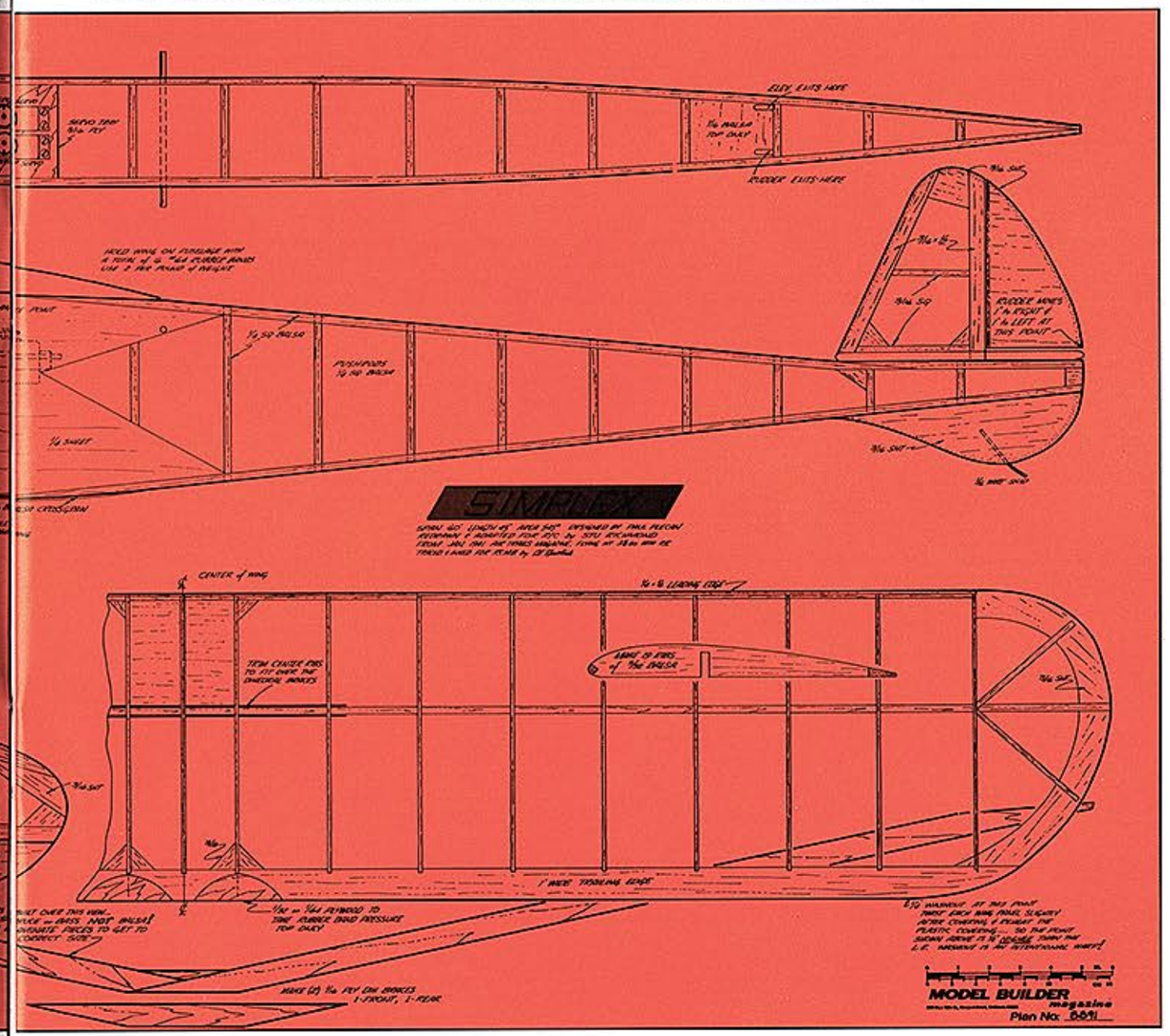
1. Models tend to fly best when the proper propeller size is matched to the flight characteristics of the model . . . and then an engine is added to turn the prop at the desired rpm.

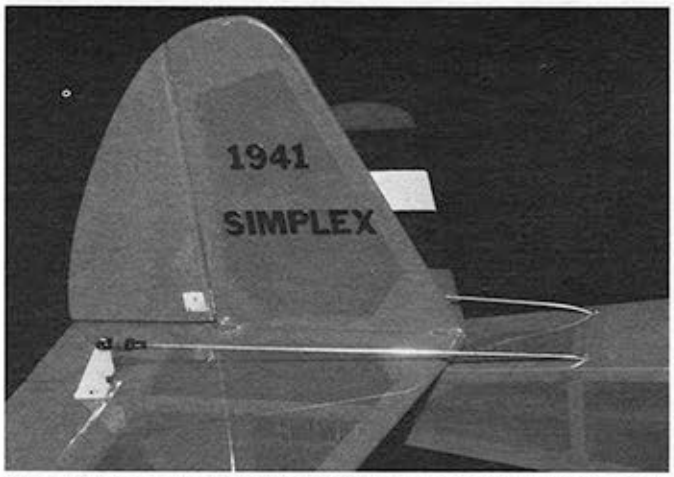
2. The original $7.95 Dennymite from 1941 probably wouldn't turn the 12x6 much or any faster than my K&B Sportster. Any of the .15 to .20 two-cycle engines should be suitable. The new O.S. .26 Surpass four-cycle ought to be a delight. My K&B peaks the 12x6 at 5800, and I've intentionally richened it a bit and the throttle barrel

Stu used transparent yellow film on the top of the wing and stab, opaque dark blue on the bottom. Dark colors make for excellent in-flight visibility, especially at high altitudes.

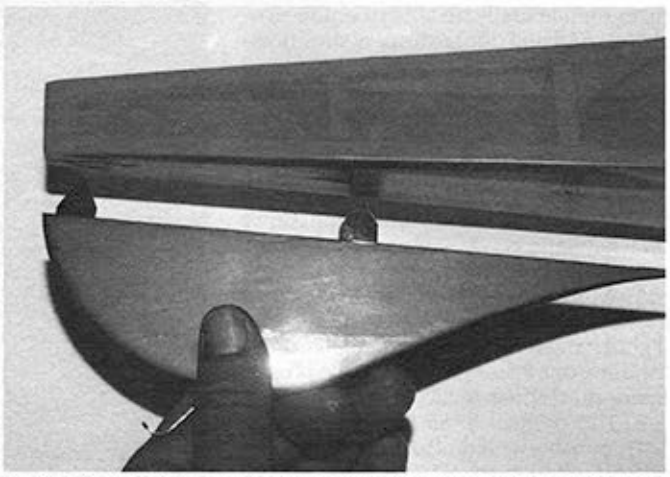


FULL-SIZE PLANS AVAILABLE—SEE PAGE 106





Flat tail surfaces go together fast and easy. Model has an elevator on just one side of the stab, works fine.



Two small tabs of .007" carbon fiber strengthen the sub-fin mounting to the fuselage.

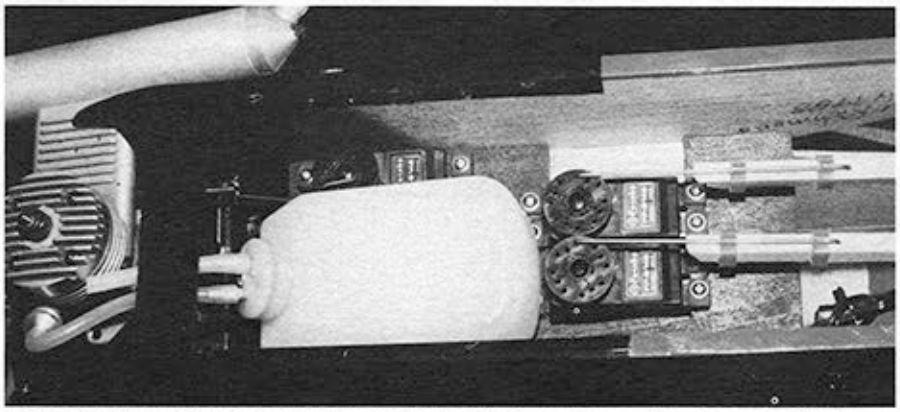
opens less than full to get the 5000 maximum rpm I've chosen to make the climb "not too steep."

3. I've now used two gallons of Byron's new fuel. Each gallon yields over thirty tankfuls/flights. The K&B has now run well past fifteen hours which I feel is an average engine's lifetime. The top of the piston is still shiny-clean, and after three or four chokes and one or two flips the engine is running every time. With slow running at a slightly rich setting you should expect your engine to give many fun-filled air hours in a Simplex.

4. If you can't get your idle slow enough, try a K&B 4520 idle bar plug or one of the new Fox Miracle Plugs.

A few flying notes:

1. This is a true free flight design from the 1940s. It is easy and economical to build and absolute fun to fly. I've had more plan requests locally than for any model I've built to date. It won't do aerobatics, but it yields slow, leisurely flying and just may be one of the finest R/C beginner's models in the air!



For proper balance, the radio should be mounted as far forward as possible. Four-ounce Sullivan slant tank gives an average flight time of 20 minutes!

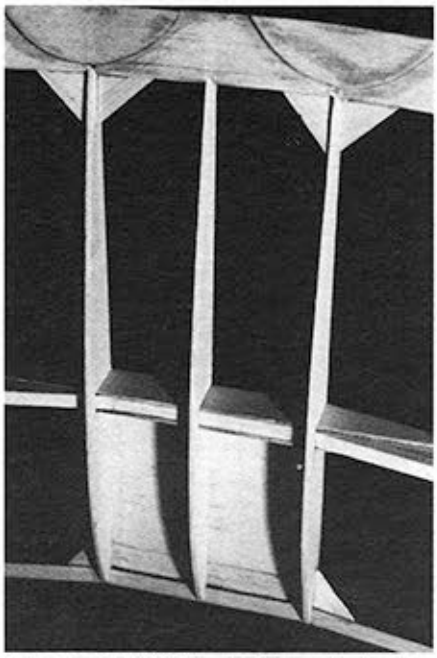
2. The Simplex should always be hand launched directly into the wind. Don't try a takeoff as the wheels are simply too far forward (they were placed forward originally to protect the prop on landing).

3. If the prevailing wind is 5 to 10 mph slip a shim of 1/16-inch balsa under the wing's trailing edge to make the model fly faster. If the wind is 10 to 15 mph use two such shims—if over 15 mph you probably shouldn't fly. The shims make the Simplex fly faster so you can get upwind easier.

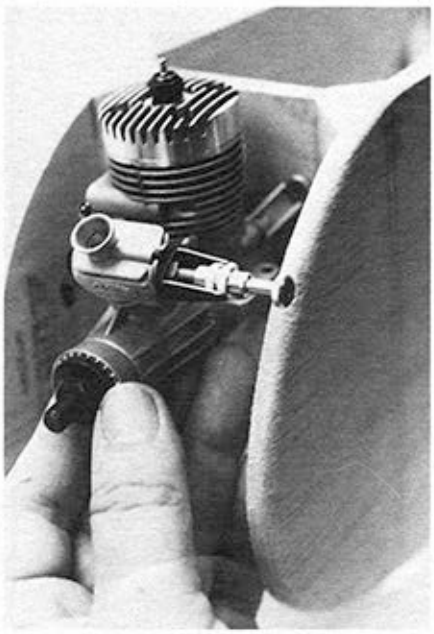
4. Be sure to cover the bottom surfaces with black or dark blue to get maximum high altitude visibility. Florida's soaring buzzards are black all over and visible. Light bottom colors tend to get lost at high altitudes.

5. This model, like most vintage designs, wants to climb steeply at high power and descends slowly with idle around 1500 rpm or with no power. Level flight with the 12x6 is maintained around 3000 rpm. By dropping the high power rpm back to 5000 from a 5800 peak I've partially minimized the steep climb tendency at full throttle. Altitude, as in a Piper Cub, should be controlled by throttle rather than elevator. An easy way to dump altitude in a hurry is to cut power and use full rudder throw to spiral down. With so much drag being so far above the thrust line, the pendulum-like swing caused by full power pointing the nose up isn't fully controllable with elevator. Please remember, Paul Plecan designed the Simplex to climb quickly with its engine running.

Today the Simplex is a superb R/C fun machine. You can float from thermal to thermal, you can loaf along in circles, ovals, or figure eights, you can teach almost anybody to fly R/C. And these R/C equipped Old Timers make wonderful formation flyers. Paul Plecan really understood the KISS (Keep It Simple, Stu) principle! •



Wing spar has 1/16" ply doublers on both sides. Spar must be spruce or basswood, *not* balsa, for adequate strength.



The K&B .20's spider mount works ideally. An aluminum or glass-filled nylon radial mount or hardwood beam mounts can be substituted for other engines.