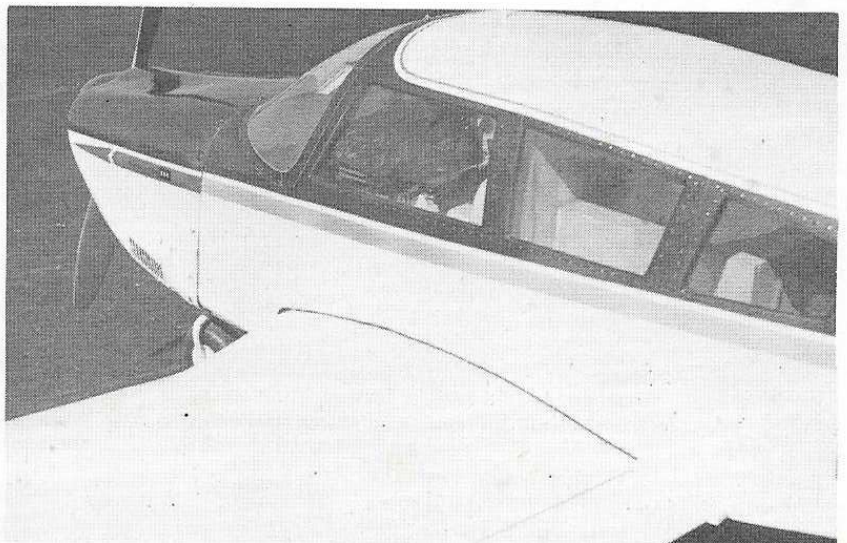




PIPER CHEROKEE ARROW 200

by Don Condon



Photos by the Author

Have you ever wanted to build a good Scale or Stand-Off Scale model that was easy to research, flexible in color scheme, and several models of the same manufacture could be built from the set of plans? Then look no further, here it is.

With very little change, you can build the Piper "Cherokee" 140 and 180.

I built the "Arrow 200" because I wanted retracts, but the 180 is identical, except for the fixed gear, and the 140 is the same but has two side windows instead of three. The fuselage, wing, tail assembly, and cowling are the same for all, at least for Stand-Off purposes. A little checking will show the slight differences in the cowling and vents.

The real joy of this model is that at all FLYING MODELS

most any airport, you can find a "Cherokee" to photograph and get your color plan from. This is a 1969 model, and if you go to a 1971, or newer, you gain another advantage. In 1971, and newer models, the wing and stab were increased two feet in span (4" on model), chord and airfoil remain the same. On this model, that's 45 square inches more area, and that makes the loading less per square foot.

Every measurement on this model is 100% scale, as is every shape and outline, including the wing and stab airfoil, so let no scale judge tell you differently, or make him prove it.

This model scored 103 to 107 (out of a possible 110), in Stand-Off Scale, and 352 (out of a possible 450) at the 1973 Nats.

If you are still interested, let's get started. To use an old phrase, this is not a beginner's project, so I will only try to explain what may not be too obvious on the plans, or anything of an unusual nature in construction. I may be able to supply you with the tail cone, windshield, foam cores and possibly the cowling for a price. Anyone interested in any and all can contact this author at 1117 Woodman Road, Janesville, Wisconsin 53545 for a cost and availability date.

The Fuselage

After making all bulkheads #0 through #7, space them out, on your building board. If you pin down #1 and #4, you can shim up the rest to keep your 1/4" by 1/4" stringer

level. Mark all bulkheads with a centerline and use one on your building board. All bulkheads are at right angles to the $\frac{1}{4}$ " stringer except #0 which has 3° forward cant for engine down thrust. #2 is marked 32° on the plan. Believe it, so your windshield will fit later on. Now put the $\frac{3}{4}$ " triangular stock on the front and rear sides. Pin the framework down from the rear of the wing to tail with $\frac{1}{8}$ " bottom sheet under it and block up #1 and #0.

Check for true alignment again, then add the $\frac{1}{32}$ " ply doubler and glue the $\frac{1}{8}$ " lower fuselage sides to frame. At this point, it had better be straight or it's too late.

If you haven't cut out bulkheads #4, 5, and 6 for your rudder and elevator push-rods, do it now.

Install the top $\frac{1}{4}$ " sheet, then the top half of the $\frac{1}{8}$ " side sheeting. Don't use too hard balsa here. Water on the outside face helps bending, or use your own favorite method if the wood resists.

The bottom sheeting between #0 and #1 should be left off until later for the tank mount, engine mount and nose gear bracket installation. Note the area from rear cowling line to the firewall must be cut out enough to allow flush mounting cowling, so you may wish to beef this up a bit more. Install $\frac{1}{2}$ "x $\frac{1}{2}$ " squares of $\frac{1}{16}$ " plywood where shown on the plan to allow for cowling screws. Your windshield goes on after the cowling is fitted. Cabin windows work out best if cut out after all sheeting is completed.

Wing Assembly

This is pretty much the same as any foam wing, but it does consist of five separate sections. The dihedral is cut into the #1 joint as shown on the wing plan. $\frac{1}{8}$ " ply dihedral braces may not have to go across joint #2, but should go at least 3" into that section. The balsa skin makes joint #2 pretty strong.

When cutting foam cores, don't forget to cut your 2° washout in the tip, and then be careful applying the skin so you don't distort it. Ailerons and flaps are built up from ribs.

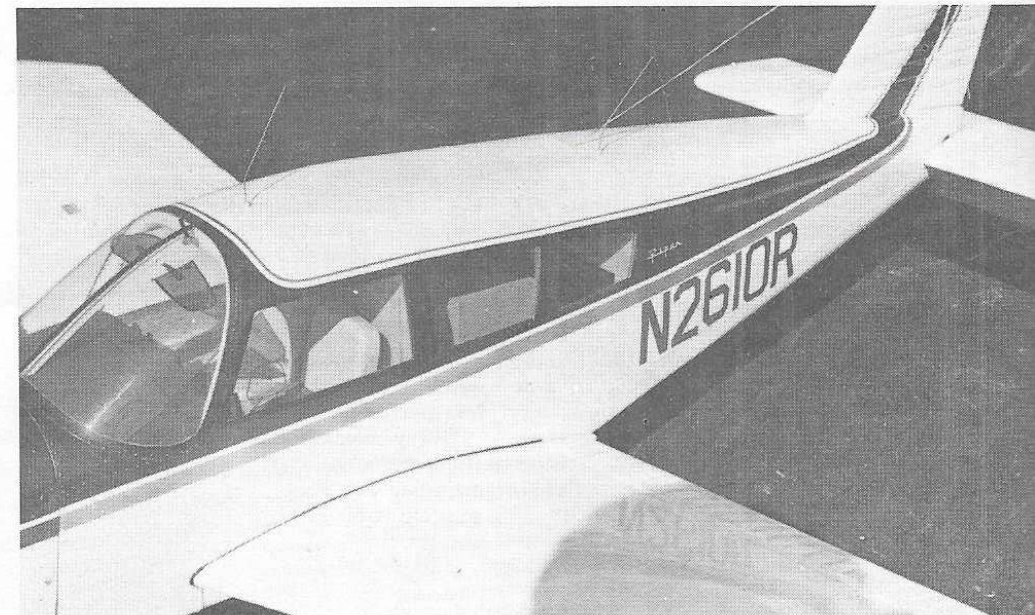
The retracts are Goldberg, operated by Sonic's pistons. Wing gear strut needs re-bending, if you use the aluminum simulated shock strut.

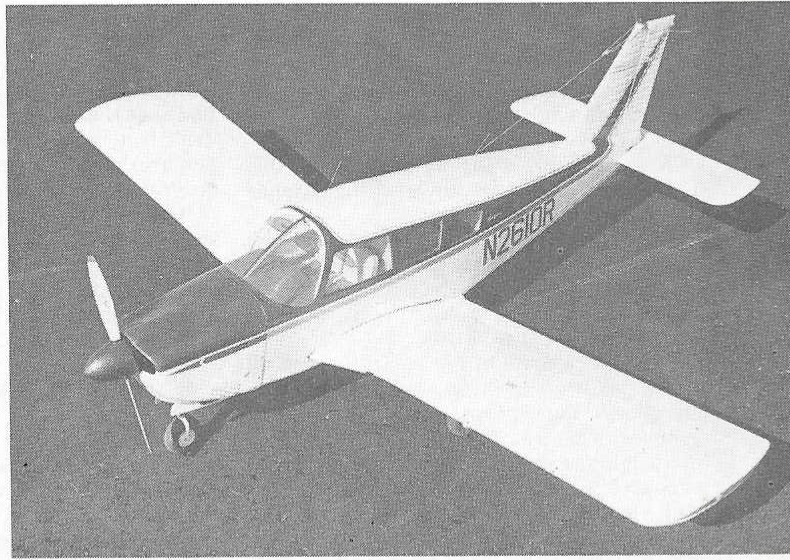
I might explain at this point, how the stiffener grooves are made in the ailerons, flaps, rudder and stab. Make the frameworks as shown on the plan, $\frac{3}{32}$ " smaller than the finished size. Cover all frameworks with light $\frac{1}{32}$ " balsa first. Count the number of grooves in each control surface. Now lay out the centerlines and lengths on a slightly oversize piece of $\frac{1}{16}$ " balsa. Next set your Dremel tool in the router jig, with the $\frac{1}{4}$ " round bit so it cuts almost through the $\frac{1}{16}$ " sheeting. Don't go quite all the way through. Now trim all pieces to size and contact to ailerons, etc., over the $\frac{1}{32}$ " sheeting. This system worked well for me, but if you have a better way, have at it.

The stabilizer is all built up, with the $\frac{1}{16}$ "- $\frac{1}{32}$ " sheeting method also. Whether you use my method for mounting the stab, or someone else's, do make it as rigid as possible, but be sure there is free movement, with no binds or side play. Total stab movement need not be more than $\frac{3}{8}$ " up and $\frac{3}{8}$ " down at the trailing edge. Too



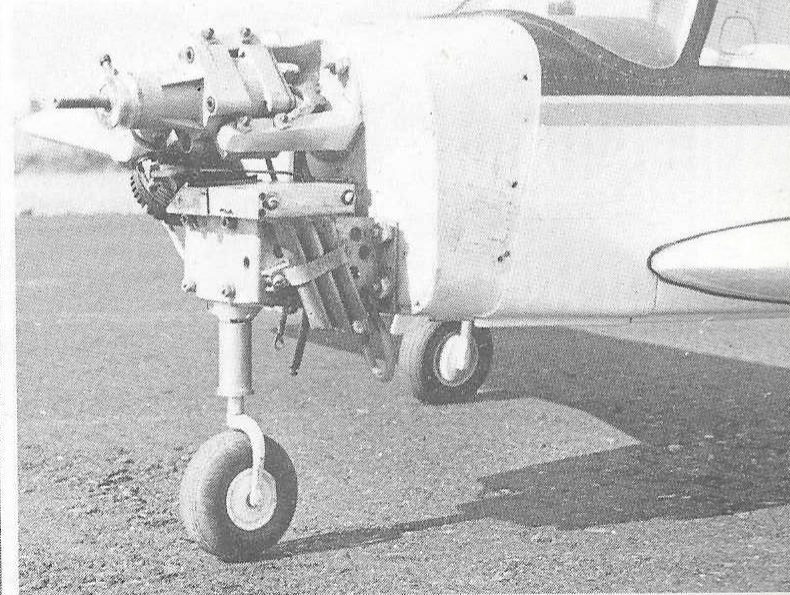
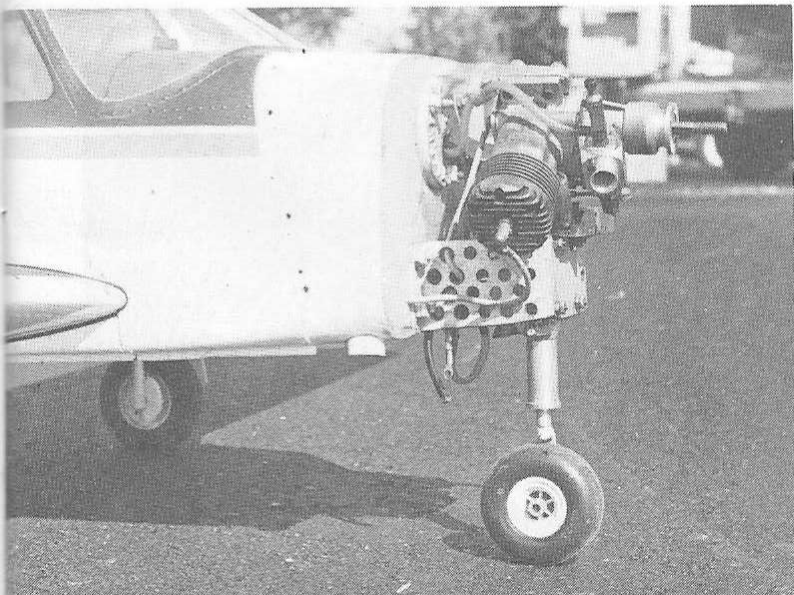
Don Condon's Cherokee Arrow 200 presents a strikingly realistic appearance from any angle and includes cockpit interior detail. The trim on the plane is actual Piper touch-up colors for authenticity.

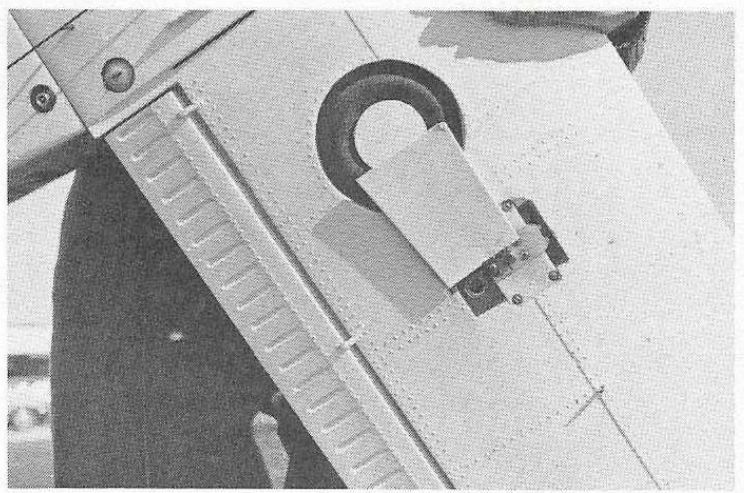
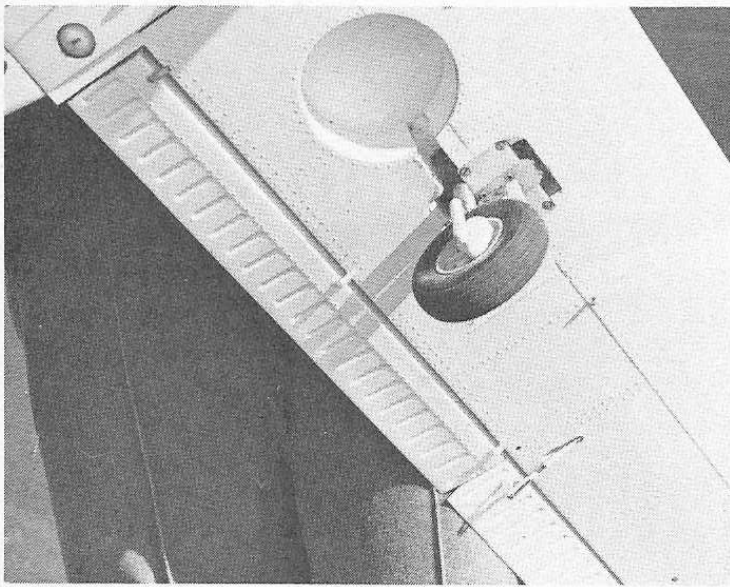




A large factor contributing to the realism of this plane is the total enclosure of the engine within the nose cowl. In the photos below, note the angle of

the engine mount, permanent glow plug wiring, nose gear mounts and the exhaust manifold and tripple exhaust pipes. It's compact.





Goldberg retract landing gear actuated by Sonic pistons makes a simple and effective operation. The stiffener grooves in the ailerons were done by cutting them in a $\frac{1}{16}$ " balsa lamination with a Dremel Moto-Tool.

much will get you in a heap of trouble as this model is relatively shortly coupled.

Cowling and Engine

The original cowling was made the Hobbycoxy "easy-does-it" way, over a balsa mold, and should be fit before engine mount and engine are installed. The Webra .61 will go completely inside if you put the mount and engine at the right angle. The plan gives you a pretty good starting point.

Any good .60 size engine will fly this bird easily, and in the air level flight takes about $\frac{1}{2}$ throttle.

For scale prop and spinner, check your full size "Cherokee" at the airport. They do vary slightly, then carve away.

Finishing

I used two coats of Sig clear dope on all wood, followed by heavy weight Silkspan on everything except areas with router grooves. This was followed by three coats of finishing resin, all sanded between coats, of course. All models of the "Cherokee" use white as the base coat. I used Vitra-Gard Polyurethane, #74-656 manufactured by Elliot Paint and Varnish Company, 4525

Fifth Avenue, Chicago, Illinois 60624. If you can't find it near home, write to them and ask for the nearest dealer to you. It sells for from \$2.50 to \$3.00 per quart.

Trim colors, whatever you choose, can be obtained through your local airport, in five ounce spray cans of original colors from Piper. How's that for authentic colors. No scale judge can argue about these. You will find that these trim colors are lacquer, but don't fret, you can spray it right over the polyurethane with no effect, but do it in several coats, please.

If you wish to go all the way for A.M.A. scale, go back out to your local airport and find your "Cherokee," then start measuring and drawing panel joints, counting rivets and all the other little added scale goodies that get you good static points.

Flying

Check your C.G., and put the stab as near 0° as you can. My model was nose heavy if you can believe it, but if you look at the side view of the plan, you will see there is a lot of heavy hardware ahead of the C.G. If yours is nose heavy a bit, don't go hanging any weights in the tail, just

live with it, it helps. Take off with about $\frac{3}{8}$ " down flap deflection, and let it get really moving. It should lift off by itself in a shallow climb out. If not, apply a little elevator to help it, but use only a little until you get the touch. Flying stabs are great, but you can't have a heavy thumb.

After trimming out, it should fly at about half throttle for a good scale effect. Aileron is quite effective, but not touchy.

On landings, use full flaps (about 1" total is O.K.) and don't try to float it in. Old proverb says, "Airplane that stalleth will falleth!" It lands no faster than any pattern ship, but may be a bit more critical to stalling because of flaps.

In General

I know you will enjoy building and flying your "Cherokee" but one little word of advice. Don't build it and hang it up just for a contest day. Take it out and fly it, and fly it and fly it some more. Remember, you can't win any contests on static points alone, and as in pattern, the more you learn about flying your model, the better your flight score will be. That's what wins contests, Pattern or Scale. ☺

Photo: Jerry Reimer



At left, the Rock County Airport in Janesville, Wis., is the background as Don's daughter Colleen holds the model in front of Paul Canary's full scale Cherokee. Below, is Don Condon with his plane ready to fly.

