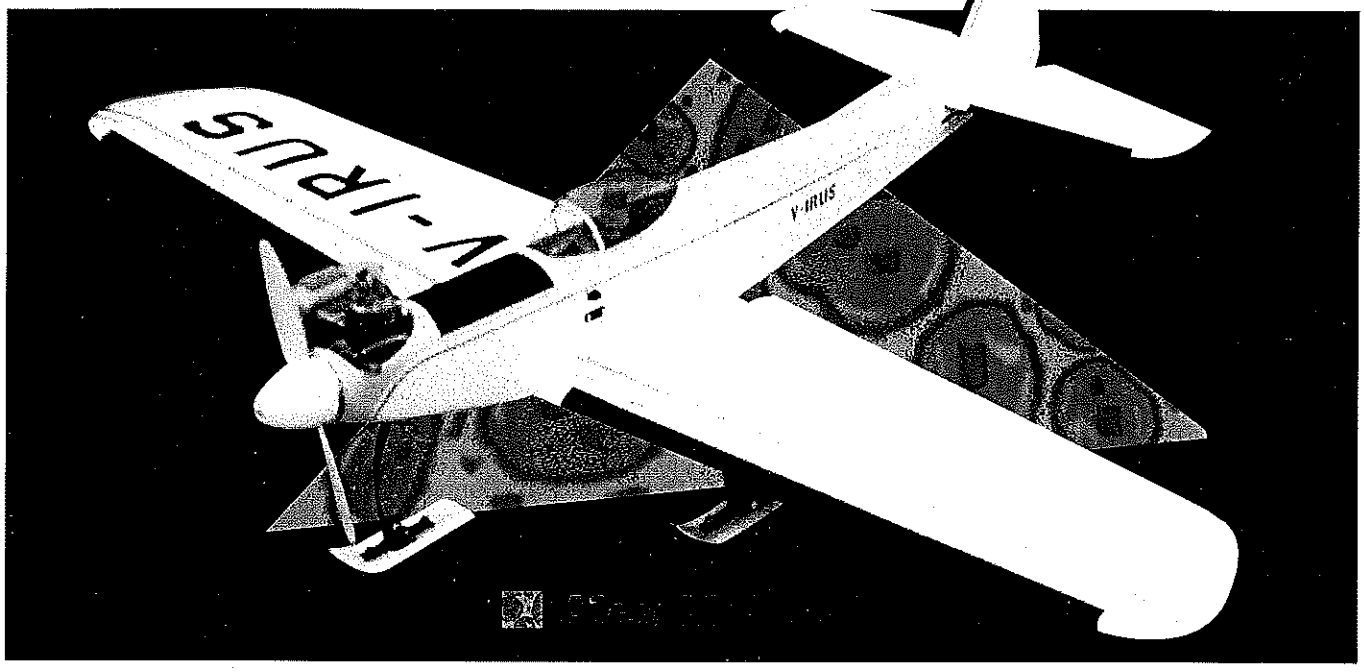
#829

VIRUS



FUN 46-INCH-SPAN AEROBATIC MODEL CAN BE TRANSPORTED IN ONE PIECE IN THE SMALLEST OF CARS. A .19-.30 HAS PLENTY OF POWER FOR THE WILDEST MANEUVERS.

A VIRUS IS A VERY SMALL THING, and it is sometimes quite potent. Our Virus is exactly that, with a price tag for materials that will keep Mother from wanting a new fur coat to keep things even. She may even think it's cute (which it is).

Don't let the small size fool you; it grooves with the best of them. With adequate power (no more than an O.S. .32 or a Webra .28) it will do the full pattern, including knife-edge maneuvers. Many small models seem to bounce around or dart here and there; Virus is very smooth because of the thick symmetrical wing, with a slightly higher-percentage tip, generous stabilizer and elevator area, and a forward center of gravity.

Above all, the model must be kept light to keep the speed down. You can fly Virus in a neighborhood schoolyard or corner lot, if the engine is quiet enough.

The model shown is the third Virus I have built; all have flown equally well. The first two were worn out or "done in" by midair collisions; this one succumbed to carelessness when inverted!

CONSTRUCTION

The model is built mostly from sheet balsa, to keep it simple and light. Remember: The smaller the model, the lighter it has to be. Don't let anyone tell you a model has to be heavy to penetrate. Not so! A light model certainly is more affected by wind gusts, but who wants to fly on gusty days?

I like to make up a kit of parts. It seems to speed up things when I get to the construction, and I can fit things together to make sure I haven't worked myself into the proverbial corner.

The balsa should be firm and stringy but light in weight: A-grain (long-grain) for wing and turtledeck sheeting; B-grain (medium-grain) for fuselage sides, etc.; and C-grain for wing ribs and tail components. *Don't use heavy sheet balsa.*

Wing: When cutting the ribs, stack eight pieces of 1/16 C-grain balsa between the root and tip rib templates. Bolt the stack together, keeping the spar notches lined up. Do this twice (once for each wing panel). Block-sand to final smooth shape. Cut the notches to fit the spars.

Begin assembly of the wing by pinning down the 1/4 sq. hard lower spar onto the plan for either right or left panel, then add the 1/4 sq. trailing edge, 1/8 sheet sub-leading edge, and the 1/4 sq. top spar. Remove from the plan and check to see that there are no twists. Repeat the process for the other wing panel.

If all is straight, join the wings at the center with an inch of dihedral at each tip, using the 1/8 plywood dihedral brace. Add the

1/16 vertical webbing. Install blocks at the front center of the wing for the 1/4 dowel and blocks at the trailing edge to support the 1/4-20 nylon wing bolts.

Sand the trailing edge to conform to the rib shape and glue on the trailing edge sheets. Leading edge sheeting is next applied on top and bottom of the wing panels after sanding the sub-leading edge to conform to the rib shape. Be certain that the leading edge sheet comes halfway back on the spar. The 1/16 x 1/4 capstrips are added to the top and bottom of each rib from trailing edge sheets to leading edge sheets. Sand everything smooth.

The wingtips are added next. The 1/4 sheet leading edge is glued in place, and the 1/16 center section sheeting is added after the 5/32 grooved main landing gear blocks are fitted into the notches in the bottom of ribs 2, 3, and 4, and 1 x 1 vertical-grain trunnion blocks. Drill a 5/32 hole in the trunnion blocks to receive the torsion gear.

Take a breather now and have several sips of liquid refreshment so that you may admire your handiwork and make airplane noises while you fly the wing around the workshop. Make sure no one hears you, or they'll think you really *are* crazy.

Sand the whole mess nice and smooth to accept whatever covering you want to use or finish your plan on to impress everyone. Fiberglass tape around the center joint is excellent insurance. The 1/4 x 3/8 hardwood blocks are glued into the aileron servo well to accept whatever type of radio you are using. I used Ace Bantam Midgets with my Silver Seven and a 250 mAh Ni-Cd pack.

Fuselage: The fuselage sides are cut from firm 3/32 B-grain balsa. The top of the side sheet is the reference line for everything, so be sure it is straight. The 3/32 balsa sheet doublers (or 1/32 plywood) are glued back to the trailing edge of the wing with cyanoacrylate (CyA) glue. Be sure to make a left side and a right side! They are the same length, since there is no side thrust or downthrust.

Glue in the 1/8 sq. and 1/8 x 1/4 strips. The 1/8 x 1/4 extends 1/8 above the fuselage side to provide a lip to the accept the 1/16 A-grain turtle deck sheeting. Bevel the 1/8 sq. balsa at the tail post so that when joined it is a total of 3/16 thick (to match the sheet rudder).

Cut formers 3 and 4 from 1/8 Lite Ply and glue them in place at a right angle to one of the sides. Glue the other side to the two formers, being certain that the straight fuselage tops are parallel. Cement the sides together at the post, ensuring that they have an equal curve from front to back and that there are no twists.

Drill the 1/4 plywood firewall (former 2) for the blind nuts to hold the engine mount you choose. Glue the firewall in place, being sure there is no downthrust or side thrust, then add the 3/8 hardwood triangular stock behind it to reinforce the joint.

The tank floor is now installed; it helps to stiffen the nose and absorb vibration. Contour the strips on the top of the fuselage to conform to the shape of the turtledeck formers, after adding them from #5 to #7. The tank and plumbing are now installed. The 1/4 sq. balsa top stringer from the nose to the tail provides a firm base for the 1/16 sheeting, which is now carefully trimmed and CyAed in place.

Former 1 is a circle of 1/16 plywood that conforms to the spinner used. This is glued to the front of the sides, and triangular stock is added behind it so that the fuselage sides, bottom, and top blocks etc. can be shaped to fair into the spinner.

Nyrods, throttle cable, and nose gear steering are best glued in place now, being sure there is no bowing. Use pieces of sheet balsa at stations 5 and 6 to prevent this. The 1/4 plywood wing hold-down blocks (at the trailing edge) are now installed. Holes are drilled later when the wing is in place.

Cross-sheeting is glued to the fuselage bottom from #4 almost to the rudder post. Plywood pieces are added at the back to serve as a base for the loop-shaped tail skid. I like this type of skid, since it makes it easier to hang the model on the wall, is a convenient carrying handle, and it keeps the rudder from being torn off on a rough landing.

Before adding the front bottom sheet, hold the wing and fuselage together and drill former 3 and the wing for the 1/4 dowel peg. Add the 3/8 sheet bottom piece from spinner to wing. Drill the wing and rear plywood blocks, then tap the blocks for the 1/4-20 nylon bolts. When everything is sanded to shape, cut a slot at the rear for the stabilizer.

A 5/32 preformed coil nose gear was used with wheel collars and a nose gear tiller arm on the outside at the bottom, which lined up with the steering pushrod from the rudder. The main gear was bent from 5/32 music wire. The 2 1/2-inch wheels seemed to look right and work quite well on a grass field.

Type: Sport Stunt
Wingspan: 46 inches
Engine: 19-.30 two-stroke; 20-26 four-stroke
Functions: Ailerons, elevator, rudder, throttle
Flying weight: 60 ounces
Construction: Balsa and plywood
Covering/finish: Sig Koverall and butyrate dope

Tail and Ailerons: Cut the stab, fin, rudder, and elevators from firm light 3/16 balsa. Sand to shape with a block and paper or similar tool. The elevator halves are joined with a 3/32 wire piece made from coat hanger wire. I like to use this so that I can twist them easily to line them up or cure an unwanted roll when the ailerons are level.

The ailerons are 1/4 x 1 aileron stock cut to length and sanded well. Be sure they are of the same weight and strength.

Finish: The type of finish is up to you, but remember that any finish is only as good as the surface it is on. I started with heat-shrink film; it was light, but didn't stand up to hard use. I refinished the Virus with Sig Koverall and butyrate dope.

(Don't get me wrong—I like heat-shrink films in some applications, but I also like to mask and paint models and use rub-on lettering. In any case use the finish of your choice but keep the model light—it will fly better!)

Install a nine-inch Sig or similar canopy. A pilot helps the illusion of realism.

The batteries should fit into the space under the tank, with the receiver above the wing leading edge and the servos just behind that on two transverse hardwood rails, reinforced in the fuselage inside with 1/16 plywood pieces. I used an Ace Silver Seven radio and Bantam Midget servos for powerful and fast response. In any case, use the lightest radio possible.

Flying: My model was nose heavy and flew rock steady—so steady, in fact, that it would do little in the way of aerobatics. After a steep approach and a dead-stick landing, the fuselage broke in half behind the wing. I reinforced it with Sig Celastic to the tail on the bottom. This moved the CG back, and made Virus an entirely different airplane.

While it is rock-steady in flight and will fly in any attitude, which shows it is neutrally stable, just touch elevator and rudder and watch the wildest snap rolls you have ever seen. In any case, balance it for the type of flying with which you are most comfortable.

Takeoffs are easy; just advance throttle and steer with the rudder, then gently add up elevator. The ailerons are quite responsive, so just keep it level on climbout until it is at least two "mistakes" high for the first flight, then carefully try the controls for any maneuver you like. This little airplane will do them all.

Landings are gentle if the model is light; with the thick wing section, just set the throttle near idle and set trims for a gentle approach, using throttle to increase or decrease the approach angle. Keeping a little throttle on allows you to flare out on touchdown. My Virus performed well on an old O.S. .30, so use whatever power you can handle. Happy Flying!

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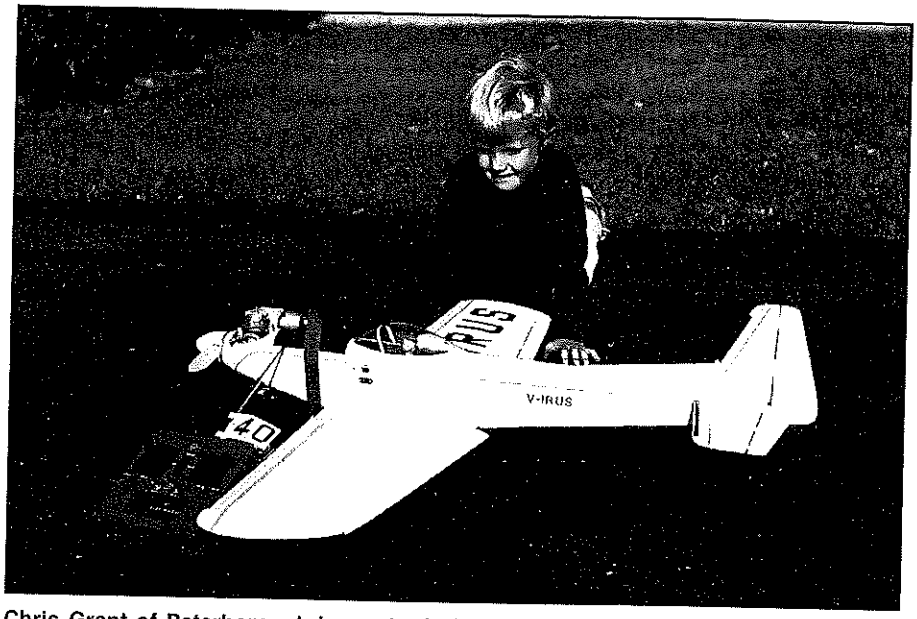
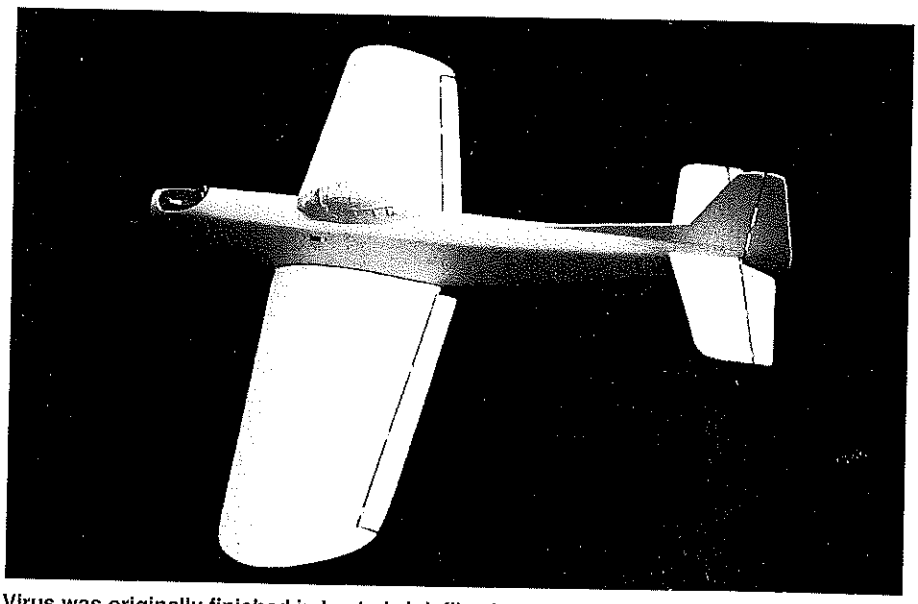
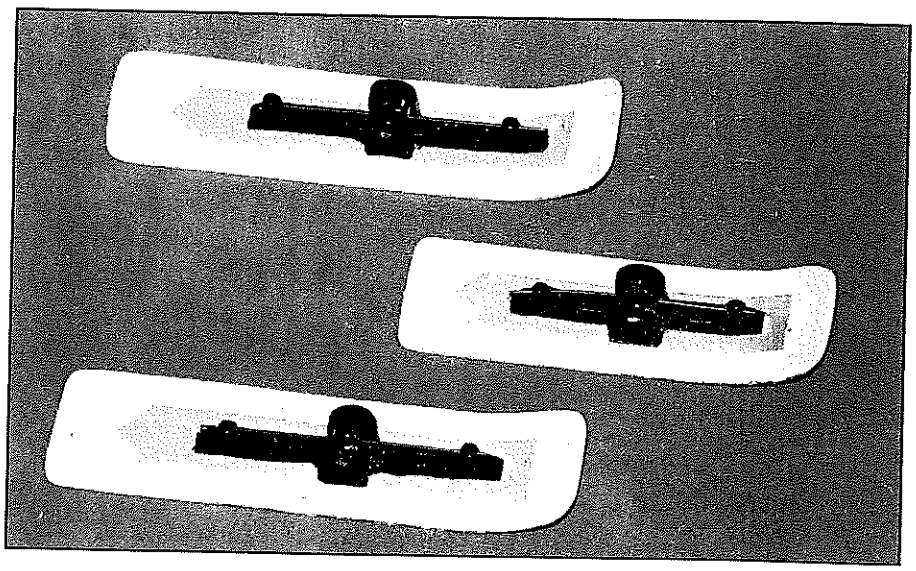


Chris Grant of Peterborough inspects the Virus. "This is our new generation of RC pilots," says the author. This version used an old O.S. .30 for power.



Virus was originally finished in heat-shrink film, but was changed to Sig Koverall and butyrate dope. Light weight is paramount, regardless of finish.



Can you tell our author is from Canada? Skis substitute for 2½-inch wheels.

Full-Size Plans Available—see page 184