NORSEMAN

CANADA

Toronto, Canada: Ron Chapman
A schoolteacher by profession, Ron Chapman has earned recognition as one of the world's top competition flyers. The Norseman is the cumulative result of his experience and continuing studies in model aerodynamics.

The end result of a long line of experimental prototypes, the Norseman III is the ultimate in total performance for multi-channel contest aircraft.

Photographs and Text by Ron Chapman

Like most good things, the Norseman is a product of evolution rather than revolution. It started back in 1959, after becoming dissatisfied with the Astro Hog. I sat down to evaluate ideal design configurations, and came up with a taper-wing ship called the "Dice." This design and subsequent modifications was built in large numbers by the local flyers.

The basic faults of this original design, resembling a Curtis P-40 in its early configuration, were bulk and weight. It was, however, successful in that it provided major wins in contests over a period of several years.

In 1961, I built several of Hal deBolt's original Simplex — since rekitted as the Viscount. The new design experimentations included full-span ailerons, light weight and quick construction. Last season we departed from the Viscount's basic concept, which resulted in the Norseman, as presented here.

First came the inverted engine, which cleaned up the front end literally as well as visually, besides providing the ultimate in accessibility for the engine and nose gear.

Next, we evaluated the moment arms originally used in the "Dice" — arriving at a slightly longer nose for grooving and penetration. At this stage, I was still using a full symmetrical section and board wing shape.

This season marked the final stages of refinement. I returned to the semi-symmetrical wing, but utilized a blunt leading edge section to smooth out the pitch maneuvers. These changes were accompanied by a slight overall reduction in size as well as wing area. The result was a light, compact, and easy to transport aircraft, with pleasing lines and extremely fast and smooth. Another advantage was its outstanding performance in either a wind or in calm air. The Norseman is as simple to construct haps even more important, it is conas a multi ship can possibly be, and persistent. Several have been built, and every one has flown off the board with only minor adjustments being necessary.

Now that you have the history, let's turn to the construction. I'm sure you will find it a pleasant surprise, and in addition, will be in for a really exciting flying season with the Norseman III.

Construction

A very unique system has been devised to provide a simple, strong, and true fuselage. The top block is cut to shape and hollowed out, but without rounding off the outside edges. This will allow the top block to sit flat on the bench. By the use of a set square, the bulkheads can be glued squarely into position. If the top block has been accurately cut and the bulkheads glued squarely into position, a perfectly true fuselage will result. After installing the bulkheads, add the motor mounts and fuel tank. The fuselage sides are pinned and glued into position, and when dry, apply a second coat of glue to make sure a strong union exists between the top block and sides. Before the bottom sheet is applied, the pushrods are placed through the bulkheads and their alignment checked. Be sure a liberal coating of glue has been applied to the eyelets so they won't break loose. The bottom block and sheet are the last to be glued down. Finally, sand the entire assembly to shape.

In the fuselage construction, all unnecessary parts and time consuming fiddling has been eliminated. In looking at the fuselage, one might think that it does not look strong enough, but let me assure you that it is more than adequate. The lamination of the fuselage sides with white glue gives a strong side, and one that does not need a lot of extra bracing. The doubler sheet and fuselage side are dampened with water on both sides before the white glue is applied. This prevents the wood from curling, due to the moisture in the glue. Wax paper, placed between each assembly, will allow both to be clamped between two flat surfaces to dry. I use two pieces of birch plywood and some "C" clamps for this purpose. The stabilizer is glued to the fuselage, with the leather fillet supplying the extra strength, plus appearance, without the necessity for a doubler.

The wing construction is shown with a conventional leading edge, as I feel many modelers do not have the facilities for forming the round sheet type used on the prototypes. Fibreglass cloth and resin adds the strength to the center section of the wing, thus eliminating the need for a lot of extra bracing. The wing is also shown fitting into the front block for those who wish to use Cam Locks instead of rubber bands to hold the wing on. I might mention, I use a liquid plastic foam in the front center section of the wing for compression purposes in the event of a hard landing. I don't feel this is necessary, however, but having done this for quite a while, find that habits are hard to break.

The wing and stab show round tips for appearance only. Those who wish to use block tips can make this alteration. The undercarriage bracing consists of ¼" square balsa. This gives sufficient strength, as the nose gear takes the brunt of landing. Because sheet nylon hinges are used, the strip ailerons can be installed and sanded to fit the wing prior to covering. A good tip to prevent strip ailerons from warping is to rub a thin coating of fibreglass resin into the wood before any dope is applied to them. This will stiffen the wood so that they remain true and not be pulled out of shape by the dope. The aileron bell cranks are the same type as used on the Viscount and the measurement can be taken from the plan.

The stabilizer utilizes the construction developed by deBolt in his Viscount. This construction gives a light and strong structure, preventing warping. An external elevator horn is used as it is easier to adjust at the flying field.

We used the servo tray configuration illustrated in the January issue of R/C Modeler. I strongly recommend that this system be used. My first reason is that the weight is concentrated in the area over the wing. Secondly, the maintenance is cut down due to the wires which are fastened down under the tray. Third, the trim bar is so versatile, it can be adjusted to give any degree of elevator and trim throw desired.

While on the subject of trimming, I do not feel that modelers spend enough time trimming out their ships. The only way to get a model to fly to its full potential is to trim it so it flies properly. The elevator control horn and aileron arms will give a good control movement to start with, but each model will vary slightly, due to heavy or light stabs. The only good way is to fly and trim, fly and trim, until the model performs properly.

The cowl rates some mention, as few modelers have experimented with fibreglass. First, make a male mould of balsa, the shape of the finished cowl, less approximately 1/16" on each side to allow for material thickness. Next, the male mould is doped to a high gloss and then waxed until all the pores are filled. Now construct a four sided frame about six inches deep and place on top of several newspapers. Position the male

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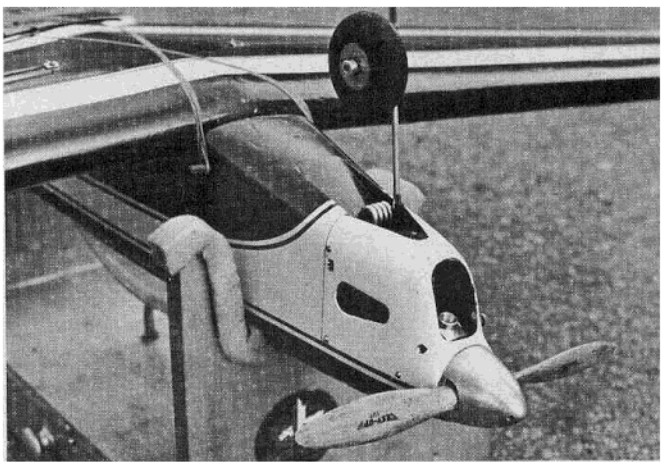

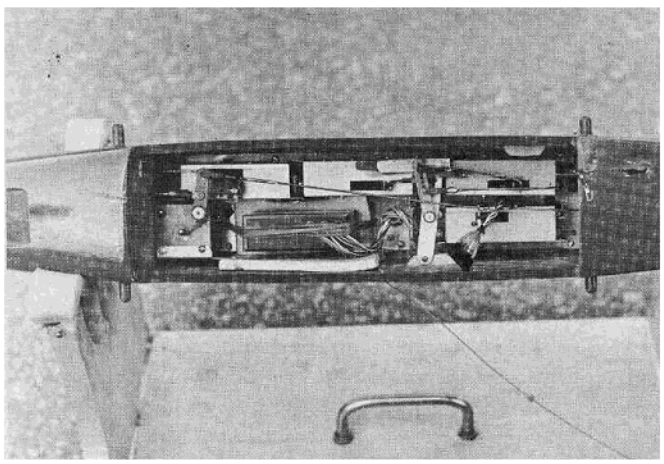

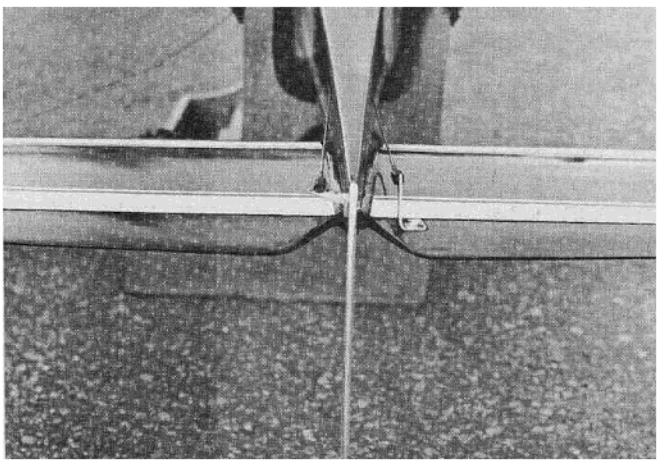

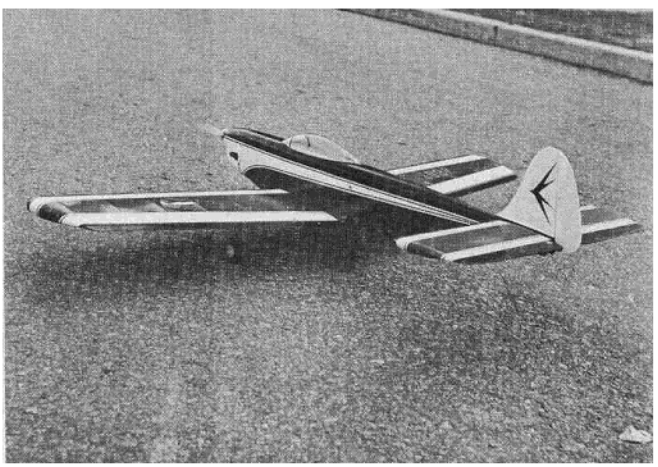

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mould at the bottom of the frame, and pour some plaster on top of the mould. Plaster of paris can be used, although your local building supply store probably has some proper moulding plaster in stock. When the plaster has dried, the male mould can be removed, and the imperfections filled in. You now have a female mould to manufacture cowls. There are many releasing agents available, but I use paraffin wax melted and poured into the mould, with the excess being poured off. Once a good coating of wax has covered the female mould, a layer of heavy fibreglass cloth is placed into the mould and pushed down until it follows the contour. Paint a coating of resin over the cloth, and when it has set, repeat, until three layers of cloth have been added. After the three layers have set, the cowl is removed and the small air bubbles filled with resin. The cowl can be sanded nicely with production paper (180 Silicon Carbide), which is available from any auto paint supply company. Carefully sand the cowl to fit the nose, then cut and sand the necessary openings. Once you have the female mould, you go into business producing them if you desire, as the female mould does not wear out with use. Believe me, the cowl is worth the effort, as it adds looks and ease of maintenance for the engine and nose gear.

As for starting the engine, I flip the model over and hold it in a cradle, the latter doubling as a field box. This makes starting an inverted motor easy, and nice to work on when necessary. I have experienced no difficulty with an inverted engine insofar as idle is concerned, and when you see the model taxi out and hear the comments of the spectators, you'll feel it's worth the extra effort!
from power to glide.

Make the first few flights of short duration until you get the model adjusted just the way you want it. The regular tank with the Cox .020 gives about two minutes of power, so you won't have to worry too much about flyaways — particularly if you've picked a quiet day. If there is a wind, be sure and fly the model *upwind* so it will always be drifting towards you rather than away from you.

Finally, just in case you don't have a smooth runway, here's the way to hand launch the Virus. Again, it's best if you have a friend who can launch it so you can be behind him and ready with the transmitter if necessary.

With the engine running and radio turned on, have your friend hold the model for a moment while you check the controls to be sure they are responding properly to your command. Then, at your signal, he should run smoothly forward, holding the model *level*, and with a smooth arm action, launch the model right at the horizon — not up! The engine will then bite into the airstream and pull the model into its normal climb. Another thing, don't heave the model so fast that it develops excess speed and a resultant zoom-up, because it will stall and dive to the ground before you can correct it. The best launch is one where the model virtually flies right out of your hand.

On the first flights your action should be mostly short commands of right or left rudder for gentle turns. After you get the hang of it, you can hold the commands longer, and if you wish, increase the rudder throw. Then you can get spiral dives with swooping recoveries. And after that, you're ready to add elevator control and go into stunting.

But that's another story. For now, you've got the Virus. There's no cure for the R/C fever that the Virus gives you. But who needs a cure for such a fever?

This concludes our three-part series, Blueprint for Beginners. We'd appreciate hearing your comments and about your experiences with the Virus — write us, care of R/C Modeler Magazine.

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