PIPER VAGABOND
— COLT — TRI-PACER

By Bryce C. Petersen

The one thing you can always count on when you join the model aviation world is the total lack of boredom. You have just completed your 100th flight with your faithful old bird and your mind starts to think about fishing, boating, and air conditioning, etc. The station wagon that entered the field awhile ago has attracted a crowd so you drift over for a look. A giant model is being assembled, and it is so big that the landing gear must be removed for transport. The model is upright now, and I heard someone say that it is 1/4 Scale.

The beaming modeler has just finished pumping fuel in the tank and has moved around to start things up. All I could think about was "all that MonoKote!"

What's this? He is using four fingers to flip the prop. Most unusual! Suddenly the big engine comes to life, but it is just ticking over. When he starts to taxi I noticed something odd. The wings are not bouncing up and down. A closer look and I see the wheels absorbing the shock just like the real ones do. A nice wide circle at the end of the runway and I say right out loud, "Boy, that's super."

Join the Quarter Scale group with this Piper. Designed for a .60 size engine, it's very realistic in the air and easy to fly.

When he starts his roll-out, something else was different. He is using only 1/3 throttle, and look at that --- the tail is already up. When the big model passed by me, it had already transferred from ground to air. While watching the gentle climb-out, I knew that modeling holds a new adventure for me. Having not really absorbed what I had just seen, the big model came in gently over the runway and set its big wheels down ever so softly with its tail still in the air. I think it was watching that big tail sink slowly down that was the clincher for me. The next day I started the drawings for the 1/4 Scale Vagabond.

In all my experience with model airplanes, I haven't seen a design that performs with the grace and smoothness the Vagabond possesses; that includes the kit trainers that show up at the field.

Piper Aircraft must have felt the same way, because from the Vagabond design came the famous Colt and Tri-Pacer. All they really did is make it a little bigger and change to a tricycle landing gear.

I personally love to fly tail draggers and spend most of the time trying for the perfect three-point landing. If you are a nose wheel man, I have tried to add enough detail to the plan to build the Colt or the Tri-Pacer. If you build the

The family of Vagabonds — Micro Vagabond in front (RCM Plan No. 742, $1.50), .19 Powered Vagabond (RCM Plan No. 500, $3.25), 1/4 Scale Vagabond (RCM Plan No. 764, $6.50).

Vagabond, the color scheme was always solid yellow with no trim. The Colt and Tri-Pacer was always two-toned --- white and what have you with lots of trim.

Back to the model. I would like to explain several theories I have about the construction of this model. First, the engine mount and location. The engine is mounted in solid wood with big sheet metal screws. The wood mount is epoxied lengthwise to the plywood doublers that make up the fuselage itself. This all becomes solid as a rock. The other way is to use a metal or plastic motor mount that is mounted to a 90° firewall with 8 bolts. The firewall can become a vibrator and there goes your 8 bolts. The firewall engine mount technique also requires a removable cowling that is usually made from plastic. Enough said.

The upright engine hanging out in the breeze is considered an eyesore when it could have been fully cowled. Well, there's more to it than that.

Consider a situation I have witnessed. I have entered a Stand-Off Scale contest and am waiting on the flight line, next to fly. The contestant in front of me has a beautiful Spitfire and has scored high on static points. His engine is fully cowled and inverted. The C.D. gives him the go signal and his model sits upside down on a cradle. He gives the starter a quick bump and the engine starts. A quick flip of the aircraft and he starts his taxi.

When he advances the throttle, the engine sags and quits. A mad rush with a starter out on the field for a quick start in the upright position. After finally finding the hole for the glo-plug, a mad bump with the starter sends the front half of the spinner down the runway. The C.D. calmly announces that his time is up. While walking his aircraft back to the pits, he tells me that the competition is over for him because his overheated engine quit on his first round.

In contrast to his effort, my engine usually starts on the first or second flip because I pulled the fuel line on the last flight and let the engine run dry. The exact prime was added for easy starting.

Once in the air the smoothness of the aircraft and engine scores big, and everyone forgets that shiny power plant sticking out up front.

Big scale contests are another matter. What I am talking about is the average fun-fly in your local area and not the Nationals.

Next from my soapbox is the basic rule of success, and that is to "keep things simple." The Vagabond uses solid foam fuselage halves front to back. The cowling is made up of two pieces of plywood. The side stringers from scrap balsa .

I wanted to use foam wings for simplicity, but I like to look up through the MonoKote at the wing ribs while flying.

The Vagabond is only a three-channel airplane. You simply do not need more control. If a gust of wind dips a wing tip on final, you touch a little rudder and it responds exactly like ailerons. A trick for spot landings is to reduce throttle until your model starts to sink over the end of the runway. A touch of throttle will check the sink rate at about 18" of altitude. As you approach the spot, you kill the engine and she drops in the spot on all three points. You can score big in the limbo event the same way by gauging altitude with throttle.

What all this adds up to is the Vagabond is one super stable airplane. Its low aspect ratio wing and short coupled fuselage make it perfect for scale modeling. It gives you excellent control in slow flight and high performance at top speed.

This is a big model. My wife says it is too big. It uses most of the floor in the Recreation Room. Everyone seems to be building big models. I understand there is a club in Pennsylvania that will not accept a member who builds models under six feet.

Actually, this model is not quite 1/4 Scale. Another inch and it will not fit in my car. Three more inches and it is 1/4 Scale but the transport problem reigned supreme. So let's get to the construction.

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CONSTRUCTION

We will start construction with the fuselage. Place your hot wire cutter on your workbench on two 5/8" standoffs and secure with weights. Feed your foam block through the cutter and slice a sheet of foam 5/8" thick for both fuselage halves. Finish your cut-outs with a jigsaw and lightly sand the saw cuts. Mark off your 1/8" light plywood inside doublers using the fuselage halves. You should be able to get both doublers from one sheet of plywood. Using 12-minute epoxy, secure the plywood doublers to the foam sides. On a flat table, stand the fuselage halves up and secure the landing gear platform (1/8" hard plywood).

Draw a straight line on your work table and center your fuselage front to back on this line. Pull the tail section together using the line for perfect alignment. Sand the inside of the foam joint so that it is 3/8" thick at its rearmost end and secure with epoxy.

With 1/8" balsa crossgrain, sheet the top and bottom (Photos 1 and 2).

Prepare your F1 bulkhead from 1/8" light plywood including the position lines. Using a "C" clamp, pull in the nose of the fuselage as per plans and sand the end flat. Again, use the line on your workbench for alignment and secure the F1 bulkhead to fit the position marks and secure.

Cut your engine mount from 1/2" plywood and epoxy in place. Be sure the right thrust side is correct (Photos No. 3 and 4).

Now you can add your F4 1/4" fillets using the cut and fit method.

You may have noticed that there are no bulkheads in the fuselage. I see no need for them and this becomes a real advantage when installing radio gear, cameras, parachutes, etc.

The next step is a real joy in the workshop because you accomplish so much with so little effort.

Using 1/32" aircraft plywood, sheet the bottom cowling (Photo No. 5). First, wrap wax paper around the area and mark a pattern. Using the pattern, cut the plywood and wet the area where the cowling bends around the bottom of the fuselage. With 12-minute epoxy, secure the bottom cowling in place and hold with oversized "T" pins.

Next, we mount the engine. With the different types of carburetors, etc., it is easy to make things fit (Photos No. 6 and 7).

Photo No. 8 shows another pattern for the top of the cowling. The complete cowling is made up of two pieces of plywood. It is a good idea to box in, around, and under your engine and cover with a generous amount of epoxy. Stray oil can find its way back through the fuselage if you don't drain it out from under the engine with a drain tube.

Next, we sheet the top of the cowling and add the balsa nose block (Photo No. 9). You can make the nose block from one sheet of 1/2" balsa in three layers. Make it slightly oversize as per F1 on plan and sand flush with ply cowling.

Photo No. 10 is the completed fuselage showing the 1/4" stringers and landing gear in place.

Stabilizer and Rudder:

First, you epoxy together several sheets of 1/4" and 1/8" balsa to make solid sheets of 3/8" stock. Next, we stack cut two each of S1 to S6.

Lay a sheet of wax paper over the plan and epoxy the parts in place — Photo No. 12. A sanding block will help square up the joints. Since you probably over-cut the parts a little, your only concern is that the joints fit and each part covers the plan where it is supposed to.

Photo No. 13 is a quick and easy way to smooth the ragged outside edges of your parts.

A belt sander upside down on a table and the job is completed in minutes.

Photo No. 14 shows a quick way to round off the edges. Grip the sandpaper with your first and second fingers and, using your thumb for a guide, you **round** all outside edges of your parts. Photo No. 15 shows the completed tail assembly.

Wing:

Photo No. 16 shows the basic construction of the wing. First, we pin the leading and trailing edge to the waxed plan. Next, you pin a 1/8" spacer strip to keep the ribs 1/8" off the plan. Your 1/8" x 3/8" capstrips on the bottom of the wing will fill this gap later. Next, add

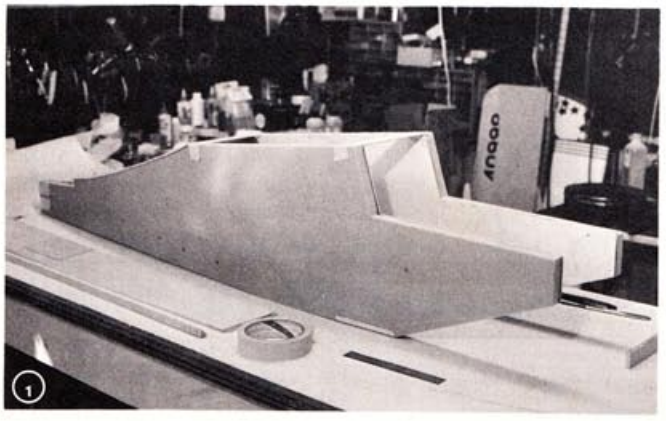
PIPER VAGABOND

Designed By : Bryce Petersen

TYPE AIRCRAFT
1/4 Sport Scale
WINGSPAN
73½ Inches
WING CHORD
15½ Inches
TOTAL WING AREA
1064 Square Inches
WING LOCATION
High Wing
AIRFOIL
Mod Clark Y
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
2⅛" Tip Rib
OVERALL FUSELAGE LENGTH
59 Inches
RADIO COMPARTMENT AREA
(L) 13" x (W) 5" x (H) 6"
STABILIZER SPAN
29⅝ Inches
STABILIZER CHORD (incl. elev.)
9½" (Avg.)
STABILIZER AREA
264 Square Inches
STAB AIRFOIL SECTION
Flat
STAB LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
10⅜ Inches
VERTICAL FIN WIDTH (incl. rud.)
10½" (Avg.)
REC. ENGINE SIZE
.60-.61 Cubic Inch
FUEL TANK SIZE
16-32 Ounce
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rud., Elev., Throt.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa, Ply & Foam
Wing	Balsa, Ply & Hardwood
Empennage	Balsa
Wt. Ready-To-Fly	124 Ounces
Wing Loading	16.7 Oz./Sq. Ft.



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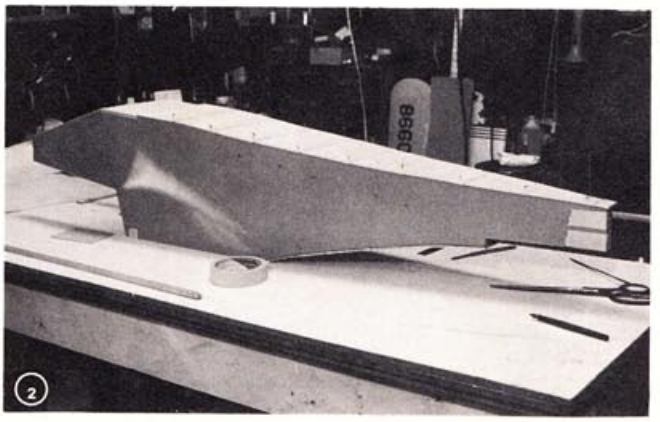
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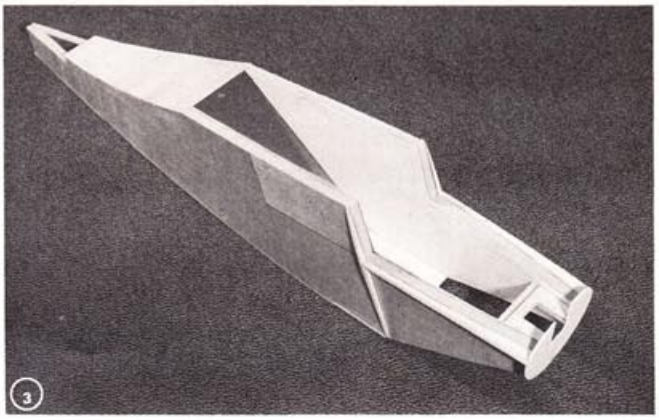
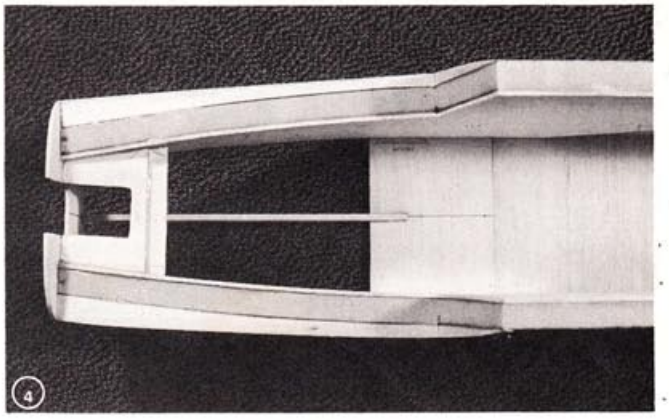
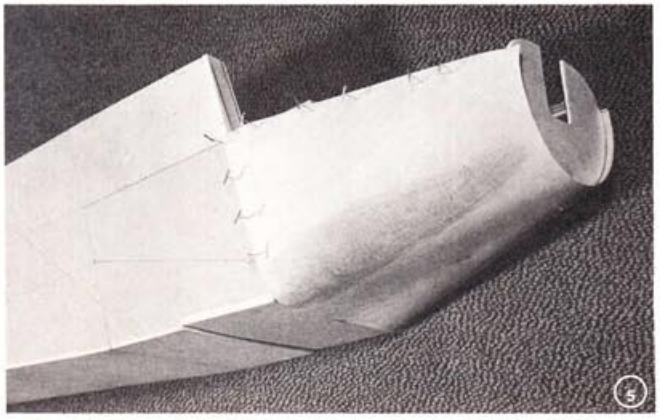
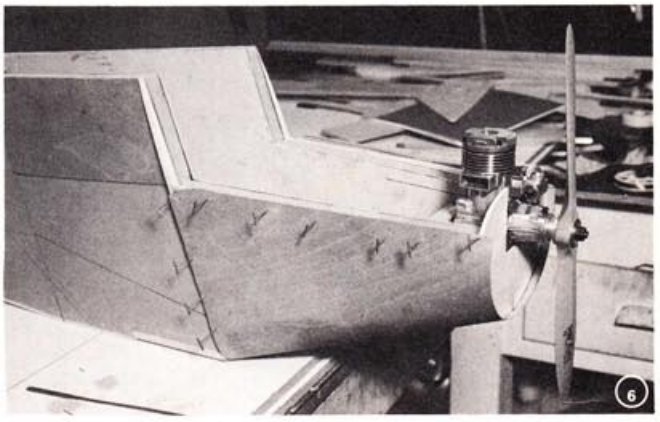
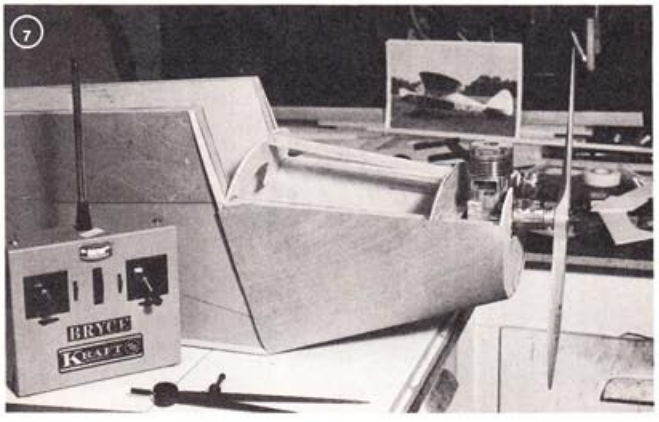
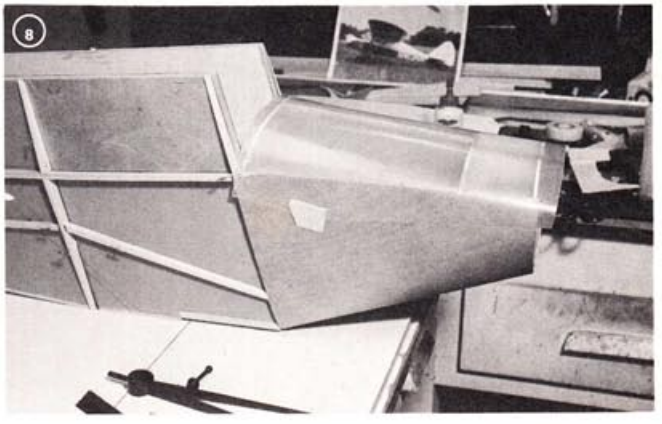


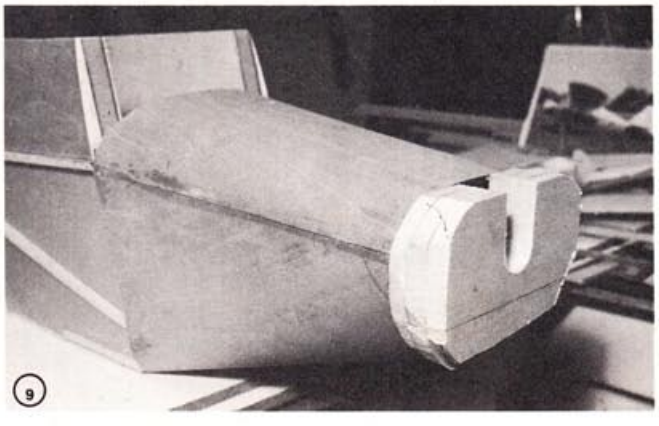


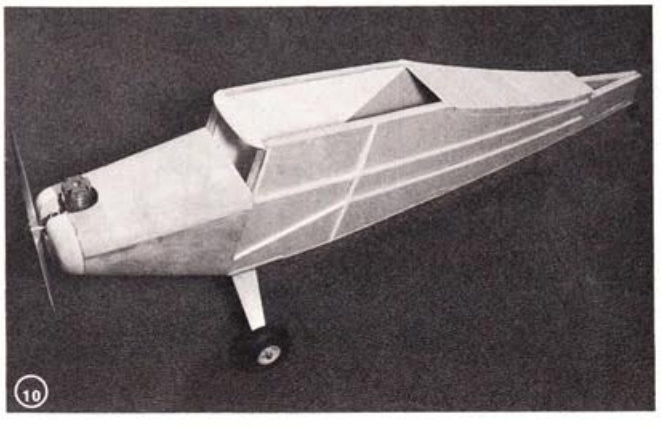








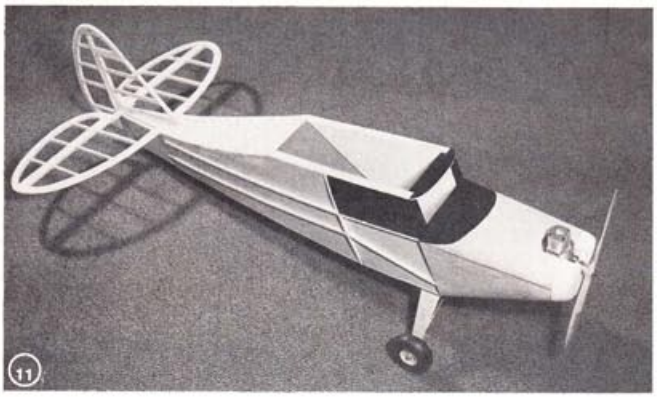


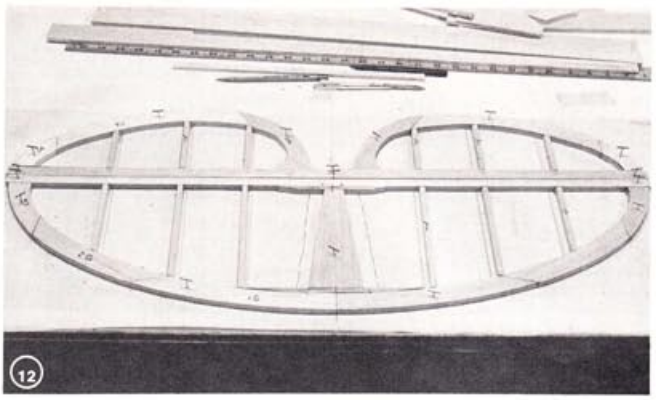


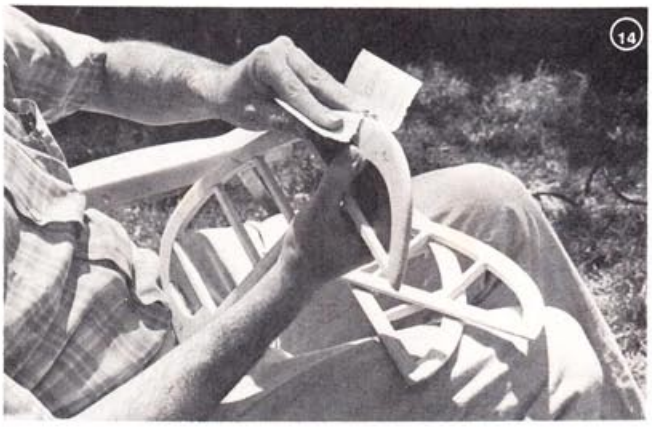
your yardstick spar and it is also raised 1/8" with spacers. Add your ribs and glue everything except the center rib which is glued when the two halves are joined together. Cut off all overhangs.

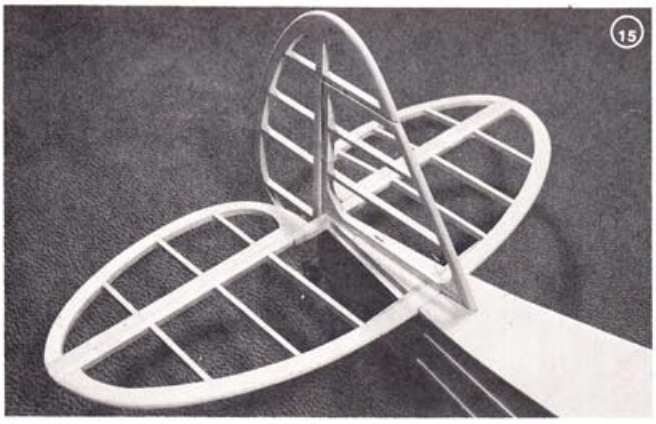
Complete the other half of the wing the same way except the center spar section is on the other end. Join the two halves together without the center rib in place and add 1/16" plywood spar braces to join the spars.

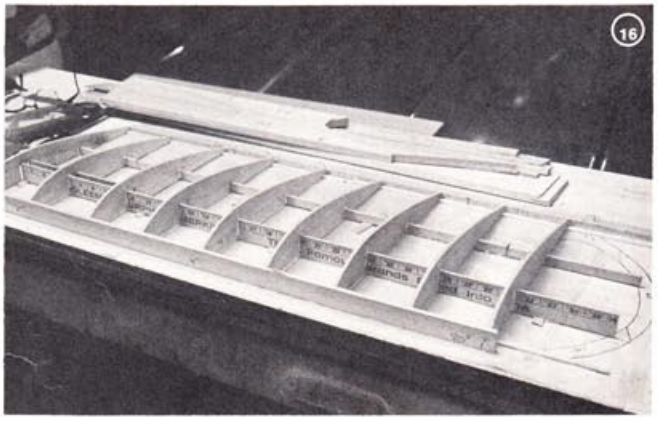
Raise both wing ends (minus tips) 2⅛" for dihedral. With a "C" clamp, join the two wings together. Next, add the center rib that is cut to fit the spar braces

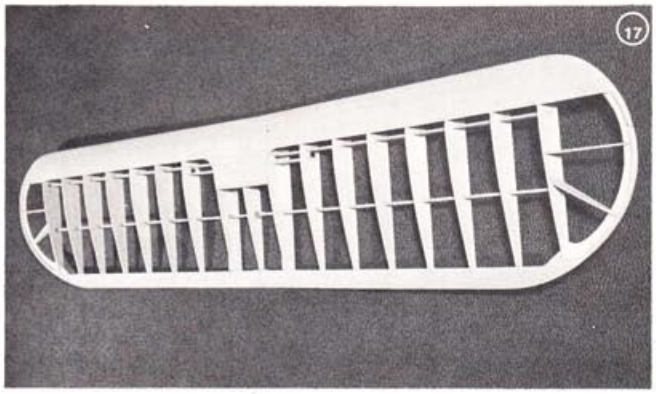












Full stall into the spot.

in the spar area.

The wing tips are cut in one piece from 1/8" light plywood. Glue them to the exact center of the leading and trailing edges. The tips are raised to 3-1/16" from the table. 1/4" scrap balsa is added to the tips to be rounded off.

Next, we add the 1/8" sheeting on top and the 1/8" x 3/8" capstrips on the bottom. The 1/8" sheeting on top is sanded down to 1/16" back in the area where the ribs start. Each rib is carefully rounded on top. This lets the MonoKote pull down over the rounded ribs for a most realistic look. Tip bracing is added and the wing is complete (Photo No. 17).

If you like to fly at full throttle, I would add wing struts.

Happy Landings.

□