

The French Dewoitine D-520

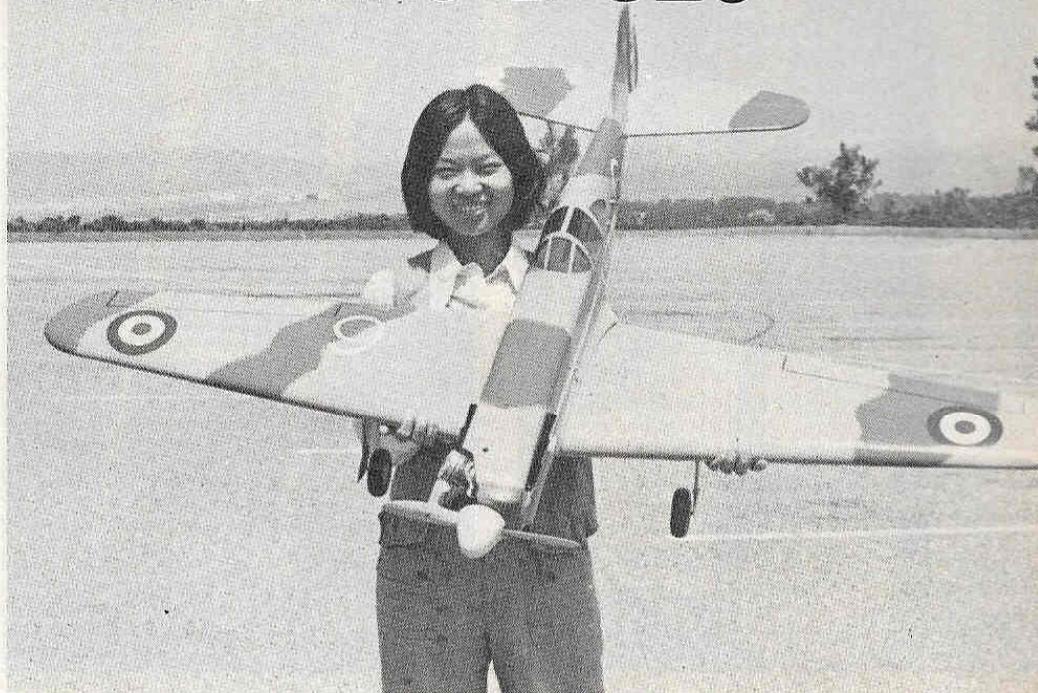
by Dan Reiss

Try a Stand-Off Scale R/C model of one of World War II's forgotten fighters. France's early capitulation cost this fine craft all hope for glory.

With our radios becoming more reliable every year, R/C'ers are putting more time into their models than ever before. I've seen sport and pattern ships with finishes and cockpit detail to rival those on the U/C ships during the 50's. Another result is the appearance of numerous Scale planes equally attractive. However, with the number of Scale kits available being so limited, repetition is beginning to set in with the models showing up. The alternative? Don't shell out all that money for those kits! Build something original and from scratch. An excellent choice is this Dewoitine 520, a French built fighter designed and built just prior to World War II. The 520's main adversary was the German ME-109E and although they were comparable in performance, the French surrender relegated their fine craft to almost oblivion. Luckily for me, I saw Profile No. 135 which details this plane very well. It's a natural for Stand-Off scale. With simple and straight lines, only a few minor changes were required to make this plane approach the performance of a sport ship. The construction is easy and strong and if you've built and flown a Kaos, you can handle this one.

Wing Assembly

Start with the wing first. Cut out the foam cores with the indicated templates. Glue on the $\frac{1}{4}$ "x $\frac{1}{2}$ " inch trailing

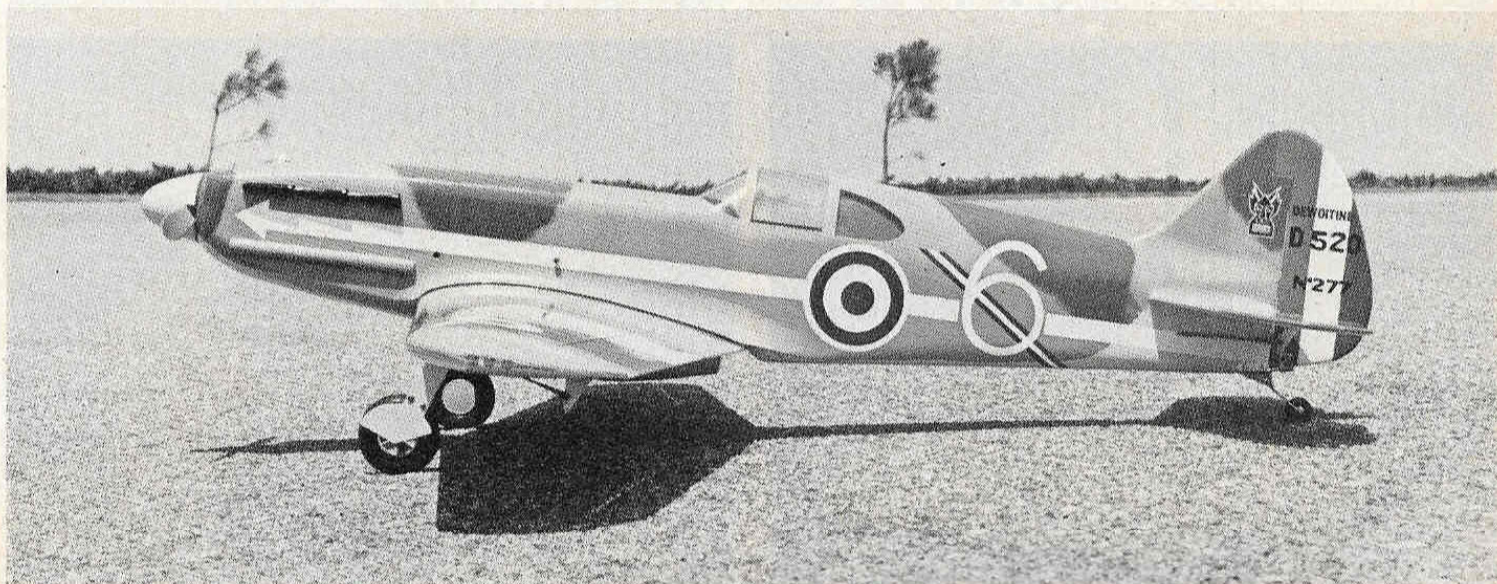


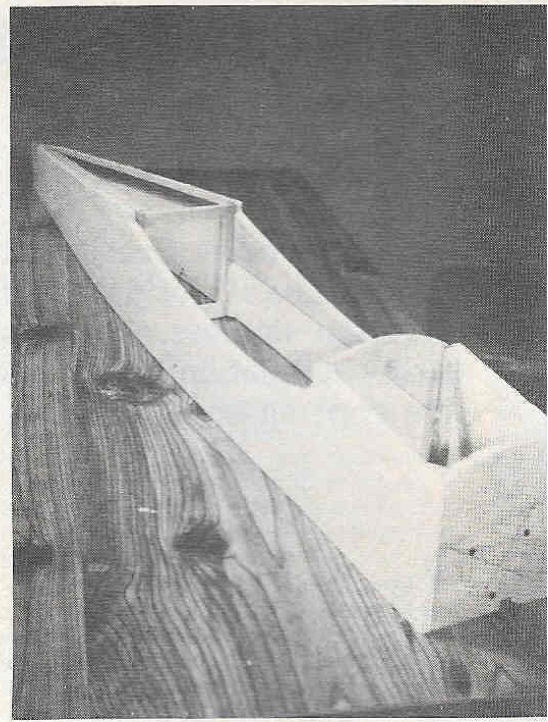
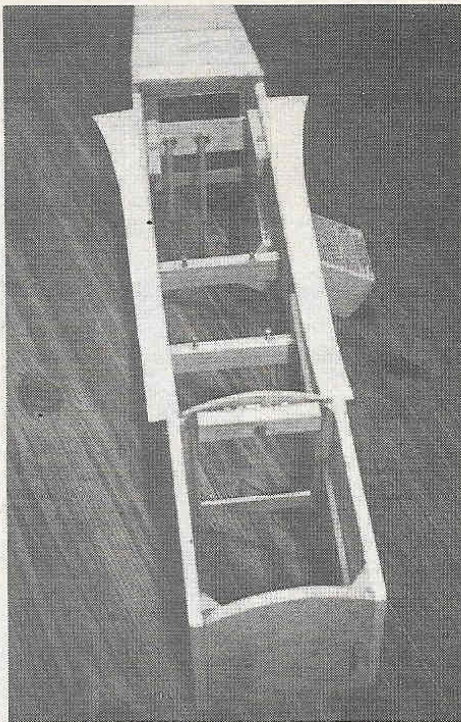
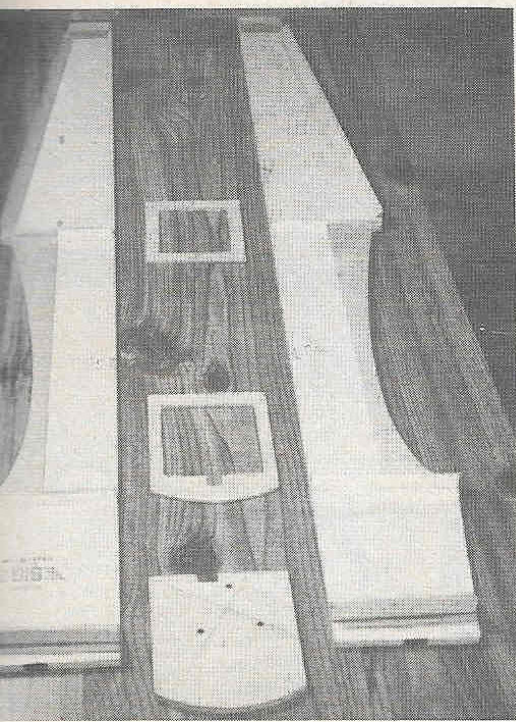
PHOTOS: DAN REISS

edge and sand it to shape. Cut out the recess for the $\frac{1}{4}$ " balsa hinge support and cement it in, making sure that it's level with the top of the wing. Install the aileron pushrod and bellcrank with the bellcrank at the wing tip as shown on the plans. Placing the bellcrank out there, your wing sheeting and bellcrank alignment procedure will be much easier. Sheet the wing with $\frac{1}{16}$ " balsa. Cut a small slot where the pushrod to the aileron will protrude from the wing skin at the bellcrank. Line up that small pushrod with it mounted in the aileron control horn and put a "Z" bend in it at the bellcrank. You can hold the control horn on the aileron at its proper location with your hand while you're doing this. Using that "Z" bend and small slot you should be able to get the pushrod into the bellcrank to check out the job you did. When you're satisfied with the alignment remove it and place it aside until you're practically done with the airplane. Don't worry. You'll always have access to

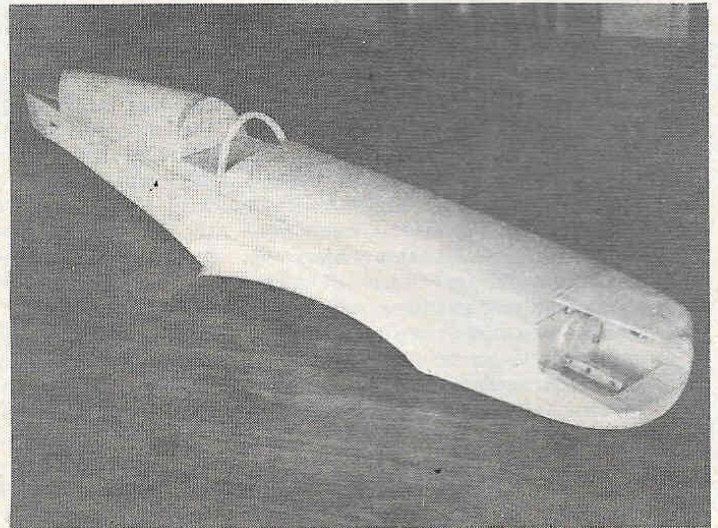
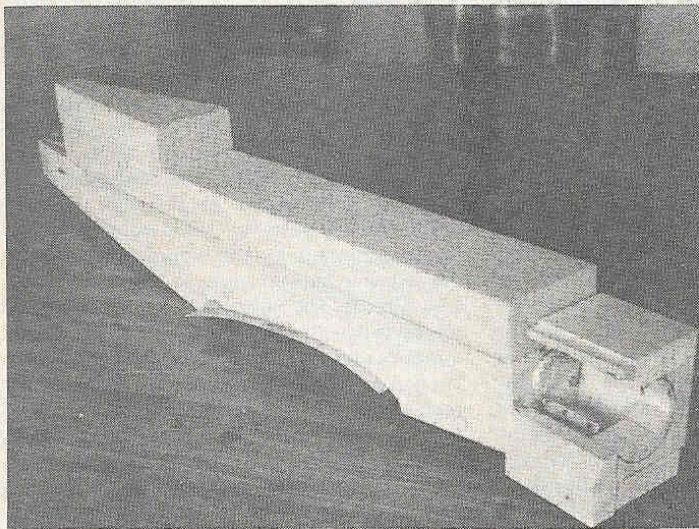
the bellcrank and yet have the pushrod out of the way. Glue on the wing tip blocks and sand them to shape.

Cut out the ailerons and sheet all the exposed edges with $\frac{1}{16}$ " inch sheet balsa. Check the ailerons for a proper fit, sanding them wherever necessary. Slice out the recess for the $\frac{1}{8}$ " plywood aileron horn mount and epoxy it in place. Make a groove along the chord line at the root of each wing panel where the $\frac{1}{4}$ " dia. wing dowel will go, then epoxy the wing halves together, leaving this groove as clear as possible. Create the aileron servo cutout and epoxy in the $\frac{1}{8}$ " plywood rear wing dowel support and the $\frac{1}{8}$ " plywood servo mount, then join the aileron pushrods together and solder on whatever linkage you need to get to your particular servo. You can check your centering by looking into the slots at the bellcranks and making sure that the bellcranks are truly perpendicular. When everything is just right remove the servo and proceed by making the land-



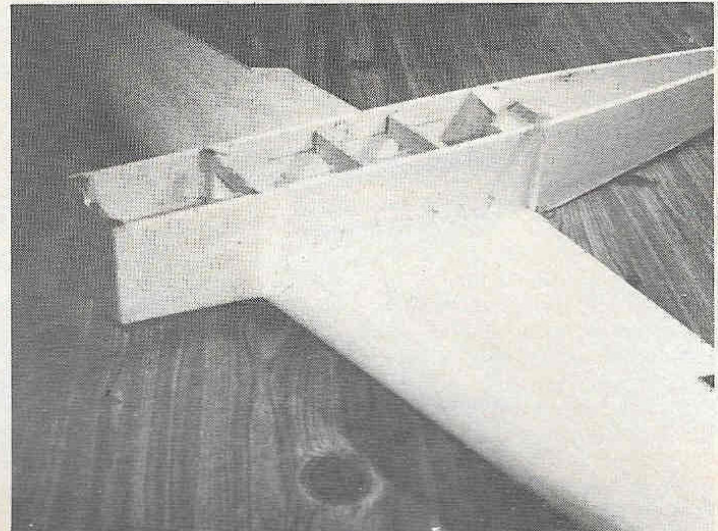
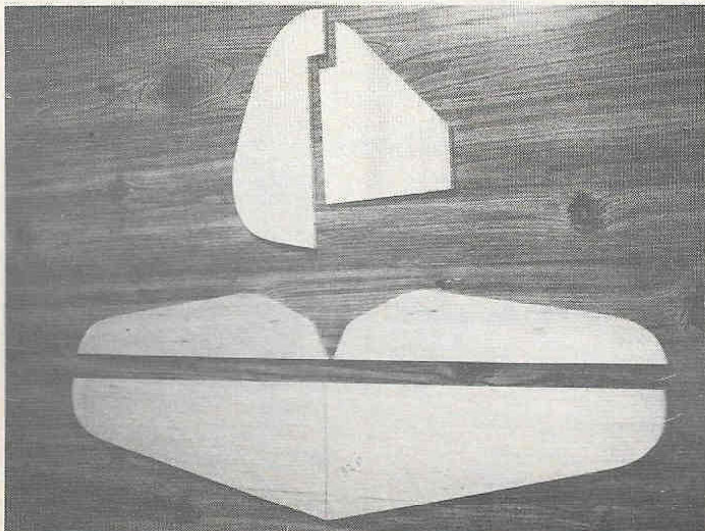


At left: Simple, straightforward structure. Two sides displayed here, with the doubler laminations, triangular reinforcements and basic formers. Top center: The forward end of the fuselage is well along here with the wing fillet taking form. The pushrods, wing hold-down blocks are visible. Upper right: The 1/4" sheet balsa siding bends around very smoothly to meet at the tailpost. Ample balsa to give you a firm feel to the fuselage.



You've got to believe! One day soon it turns into an airplane. Pro-Foam in place, ready for shaping down. The cowling takes a side mounted .61. Below: Last but not least, the tail feathers of firm 1/4" sheet balsa.

One body shaping up. Pro-Foam is suggested for the top forward decking. Windshield frame outline is of ply. Balsa blending in to form cowling. Beneath: Checking out wing saddle fit. Nylon bolts in hold-down blocks.



ing gear mount cut-outs and epoxying the mounts in place.

Fuselage

Start on the fuselage by cutting the sides from 1/4" sheet balsa. Cut the right side 1/8" shorter and angle both sides down 1/8" to yield a little right and down thrust. Glue on the 1/4" and 1/2" triangular supports and the 1/16" plywood wing saddle doubler. Cut out F-1 from 1/4" plywood and F-2 and F-3 from 1/8" plywood. Glue the fuselage sides together constantly checking the alignment. When dry, glue the tail end together once again checking the position. Install whatever hardwood you'll need back there for the particular tailwheel you're going to use.

Look over the wing to fuselage fit and sand it where necessary to get it right. Make the wing fillet support from 1/32" plywood with the grain running perpendicular to the fuselage and glue it in place using the wing to mold it until the glue dries. Cut out the leading edge of the wing to receive the front wing dowel support. Using a 1/4" dia. drill and that groove in the dihedral joint as a guide, drill out the hole for the wing dowel. Epoxy in the wing dowel and then the front wing dowel support. Finish off the leading edge of the wing, as required, with some scrap balsa. Wrap the dihedral joint with 3" fiberglass tape and resin it on. Place the wing in the fuselage and if the dowel doesn't fit within the hole in F-2 (it probably won't) open up the hole until it does and with a little extra slop. Get the wing lined up perfectly and epoxy the fuselage wing dowel support to the front of F-2. When cured, remove the wing and epoxy the two 3/8"x3/4" maple wing screw blocks to the inside of the wing saddle. When these have cured, replace the wing and drill into them through the wing, keeping the drill perpendicular to the bottom of the wing. Make your measurements carefully here and keep the wing aligned as closely as possible. Use a 7/32" dia. drill. Tap the blocks for 1/4x20 screws. Open up the holes in the wing to 1/4" plus maybe a little extra. Cut out the wing screw supports from 1/8" plywood and drill a 1/4" hole through them to provide a tight fit around your wing

screws. Place the wing in the fuselage again and re-align it. Mount the screw supports on the screws as if they were washers. Spread epoxy on them and put the screws through the wing into the blocks. Check your alignment again, very carefully, and make sure it's right on before the epoxy cures. Once it's cured, remove the wing. Carve the oil cooler from soft balsa and glue it on. You'll have to make an indentation in it, on both sides, to clear the wing screw supports. You're done with the wing, so proceed with the fuselage.

With the fuselage as it is, it's a good time to lay out your radio installation. Glue in whatever supports you need for your particular equipment and install those plastic tube-within-a-tube pushrods if you're going to use them. Glue on the 1/32" plywood bottom piece between F-1 and F-2. Drill the holes in the firewall for your radial mount, fuel lines and throttle pushrod, then coat the inside of the tank compartment with resin. Glue on the 1/8" balsa fuselage bottom behind F-3, with the grain running crosswise. Cut the foam top piece to its profile view and glue it on. Use a foam like Pro-Foam that's easy to sand and not attacked by any resin you're going to use later. Cut across slots in the foam and glue in FT-1 and FT-4. Install your engine with the spinner on it and block in the nose in front of F-1 with balsa wood. Mark the spinner outline on the balsa and remove the engine. Mold the wing fillets from micro balloons with the help of an educated finger dipped in acetone. When everything is dry, start sanding. This is quite an undertaking where a couple of hours of your undivided attention is required. Constant references to the Profile will help. An excellent aid is a small plastic model that is available from the more complete model shop. When you're through, cover the foam with four ounce cloth, applied with resin. An indentation about 1/32" deep and 1/4" wide cut in the balsa that borders the foam will help by recessing the cloth to the same level as the wood. When the resin has cured, cut out the foam for FT-3 and glue it in place. Line the cockpit with 1/16" balsa or 1/64" plywood. Cut out an indentation, about 1/4"

deep, in the foam for the windows behind the cockpit. These should be lined too. Fill any imperfections in the fuselage with microballons and sand again. An additional coat of resin on the cloth will certainly help. Another round of micro-ballons and sanding might be necessary, depending upon how critical your eye is.

Tail Surfaces

Cut out the tail parts from 1/4" balsa. Leave the elevators in one piece until you have the 3/32" dia. piano wire installed. This will guarantee a flat set of elevators. Be sure that the wire fits in easily as any tensions set into it by forcing it in to its position when the elevators are together will result in a distorted elevator when they are separated, as these stresses in the wire relax.

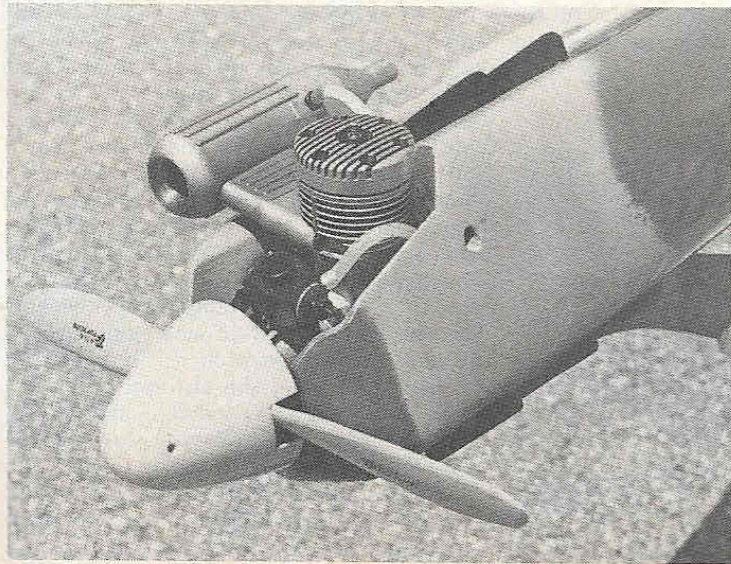
Screw the wing on to the fuselage. Using the wing as your reference, epoxy on the horizontal stab. Next, the vertical stab. Remove the wing and continue on by gluing on the pre-shaped stab filler block and the 1/4" triangular stab support. Fill in the areas around the filler block with microballons to yield a smooth transition from the turtle deck to the vertical stab, to the horizontal stab.

If you haven't started to hinge the moving surfaces, now's as good a time as any. I usually trial fit everything about now and make any corrections at this time. I don't actually epoxy the hinges in until I've completed the filling process and shot on the coat of primer. This leaves things as clear as possible with access for easy sanding.

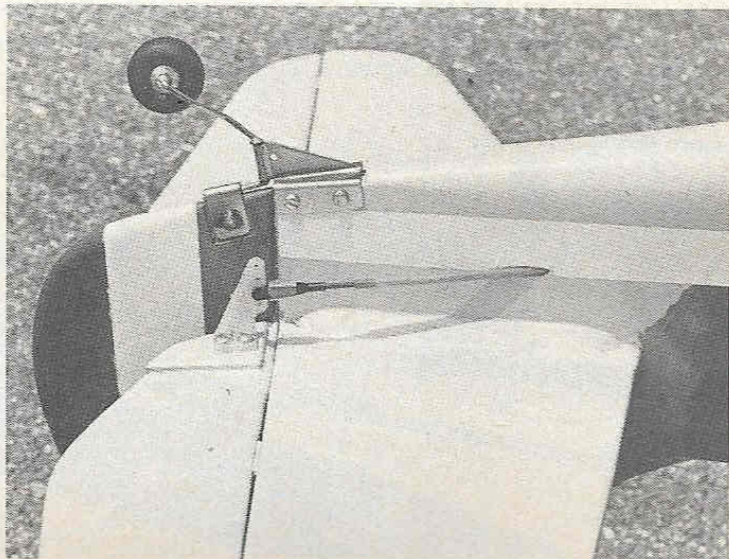
The exhaust stacks and air intakes are carved from balsa blocks. The intakes may be glued on now but finish the stacks separately and glue them on after the final coats of paint are applied.

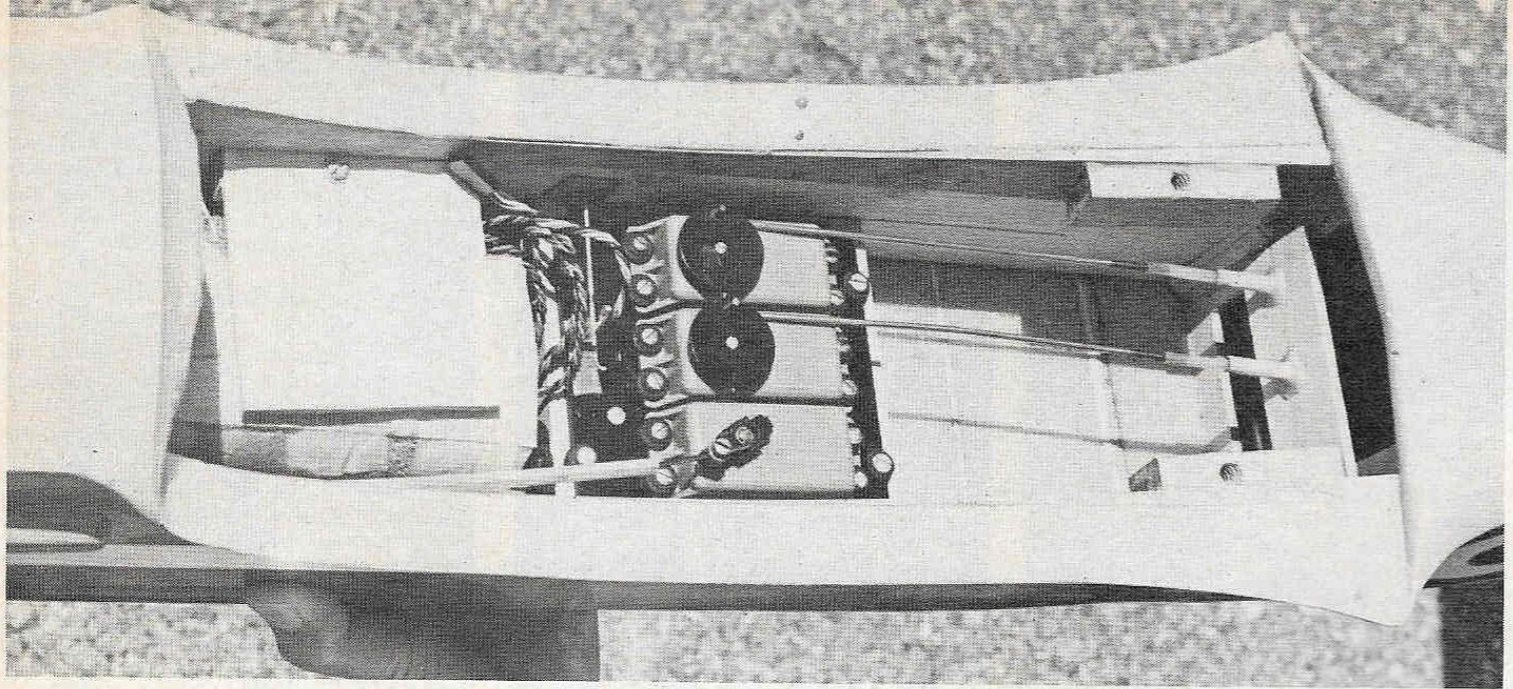
The canopy is constructed from acetate or butyrate sheets. They are all flat pieces so the construction is pretty easy. Use some 3x5 card material as templates. Trial fit and cut these as required to get the proper shape and then cut them from plastic. Bevel the balsa forward portion of FT-3 to give you the correct slope in order that the windshield may have a good surface to be epoxied to. Paint the enclosed por-

Photo below: As in all his large models Dan uses a trusty Veco .61 with integral muffler. It's pressurized. Fuselage is rotated around in this shot, the engine is side mounted. A maple Top Flite 11-4 prop is ideal.



Dan recommends the Royal Products metal tailwheel bracket as he found it to be extremely durable. Note tiller arm which swings with rudder's motion, steering the tailwheel. Fuselage mounted bracket takes impact.





A typical installation. Dan uses KPS-15 servos along with his '72 vintage Kraft on 6-meters. Ply plate at end is just a traveling precaution. **Beneath:** The finished model weighed 7 lbs. 4 ounces. 546 sq. inches of area for a 30 oz. per sq. ft. loading. A little high, keep airspeed up.

tion of the canopy with poster paint and detail it to your desires. Scuff up the borders of the plastic to give the epoxy something to grip to. Use five minute epoxy to adhere the pieces, holding them in position until the epoxy cures. A well placed pin or two will help make this job much easier. Once cured, immediately mask off the plastic to protect it and fill in all cracks and crevices as needed.

Finishing Up

Go around the airplane a couple of times with filler and sandpaper until you're satisfied. Finishing is pretty much up to the individual but here's what I did. I put on two coats of K&B's surfacing resin. A little bit of resin goes a long way, but because of its viscosity it's pretty hard to spread, especially with a camels hair brush. A useful tool is a modified paint brush. Go down to your local paint store and buy an expensive two inch paint brush. Give it a "hair cut" by trimming down the bristles much shorter than how they came. The actual final length will depend on your particular brush and is best found by trial and error. The purpose of this is to come up with a brush that will carry enough resin and still be strong enough to spread it widely and kind of force it into the wood. Just laying the resin on top of the surface will not give you the strength it is

capable of yielding. The trick is to spread it for weight consideration and force it in for strength. With this type of brush a little resin will go a long way. Your final finish will wind up smoother, stronger and above all lighter.

Sand these two coats with 180 aluminum oxide paper. Next, spray on a coat of K&B primer. Spray it on a little on the heavy side and sand it down with 220. The bottom of the plane was sprayed with a 50/50 mixture of K&B's aluminum and white. The top was first completely covered with a light gray that was a mixture of a pint of Sig's white dope and about two tablespoons or so of their black. I then added the camouflage of a 50/50 mixture of Sig's olive drab and white for the light green color and the brown was a mixture of equal parts of their red, green and white. When all of this was cured, about three days, I compounded it with Dupont's white compound using a buffing wheel.

Although the elevators and ailerons were attached after the coat of primer was applied, I left the rudder off until the plane was completely finished. This permitted me to spray on the red, white and blue stripes with K&B's Superpoxy without the hinderance of having the rest of the airplane around. It also permitted me to apply the lettering, all decals, as easily as possible.

The wheel well covers were cut from .050 aluminum sheet and finished separately too. They were first scuffed up with sandpaper and then received a coat of primer. Their color is the same as the bottom of the plane.

After the plane is compounded it's time to apply all the other decals. These were all cut from Sig's solid color decal sheets and applied as shown on the plans. If you do a good job when putting them on you don't have to protect them with any clear sealer. They'll withstand practically anything except raw fuel.

Flight Notes

Now that you're done building it's time to do some flying. Install your radio, engine and hardware. Make your installation neat and above all, reliable. Balance the plane as shown on the plans and along its roll axis. You can move the C.G. aft to your desires as you become more familiar with the plane. The position on the plans will yield a very stable and grooving type of plane. As with planes of this type they tend to come out with a heavier wing loading than you might be familiar with. The major consequence of this is that you must be more aware of your airspeed than before. This means, that you should permit the plane to gather sufficient speed on take-off before you lift her off and that upon landing it would be best to let her come in a little hot the first few landings until you get used to the plane. You'll immediately notice that the plane isn't a "floater." As you loose your airspeed the plane definitely begins to loose altitude. This isn't as bad as it sounds as long as you expect it. You'll soon be able to account for this and the landings will become "second nature" to you once again. Above all, don't try to "stretch it." If you have to, use power, not the elevator. This dictates the need for a reliable engine, especially during idle. If you lose power you had better be close to the field.

Well, I hope the 520 gives you as much pleasure as I've got from mine. I'm sure, you'll have the only one at the field. ☺

